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THE

NATURALIST:

A

MONTHLY JOURNAL OF

NATURAL HISTORY FOR THE NORTH OF ENGLAND.

EDITED BY

WM. DENISON ROEBUCK, F.L.S.,

F.R.P.S.E.,

Ex-President of the Conchological Society; Hon. Secretary of the Yorkshire Naturalists' Union; Joint-Author of a 'Handbook of the Vertebrate Fauna of Yorkshire'; Hon. Member of the Bradford Naturalists' and Microscopical Society, Cleveland Naturalists' Field Club, Malton Naturalists' Society, Liverpool Naturalists' Field Club; etc., etc.;

WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF

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CHAS. P. HOBKIRK, F.L.S., W. BARWELL TURNER, F.R.M.S.

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PREFACE.

The Editors—to whose number the name of Mr. John W. Taylor, F.L.S., has been added during the year—have to thank their subscribers and contributors, and more especially the latter for the very considerable and gratifying increase in number of the short notes which have been received.

A considerable amount of additional financial support is needed, and, if forthcoming in sufficient amount, would enable the proprietors to consider the practicability of an increase in the size of the journal and so enable the Editors to cope with the increasing mass of valuable matter which is always awaiting their attention.

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BRITISH MUSEUM (NATURAL HISTORY)

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CAPITALISATION OF SPECIFIC NAMES.—Hitherto the rule of 'The Naturalist' has been the Zoological one, that specific names shall invariably commence with a small letter, never with capitals. Henceforth, this rule will still apply to all Zoological names, but in deference to the wishes of our botanical contributors the specific names of plants will conform in this respect to the standard catalogue or monograph in each branch of botany.

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Fredk. Wm. Mills.—The Photographer's Exposure Book.—2nd revised edition, 1900, issued 13th Dec. 1899. [The Author.

THE NATURALIST

FOR 1900.

WEST LANCASHIRE FLORA NOTES.

J. A. WHELDON,

Liverpool.

For many years Mr. Albert Wilson has been engaged in the collection of material for a Flora of this Watsonian vice-county, and for the past two years I have been collaborating with him in the work. It is with the greatest pleasure that we observe a botanist of such attainments as Mr. F. Arnold Lees devoting some attention to the botany of the county in 'The Naturalist' for October, p. 299. Workers in this field are unfortunately not numerous, and as published records are few, there is some reason for Mr. Lees' statement that West Lancashire has been 'sadly neglected.' Nevertheless, perhaps quite unknown to him, steady progress has been made in cataloguing the plants of the county and tracing their distribution through its various sub-divisions. Mr. Albert Wilson recorded a large number of West Lancashire species through the medium of Mr. Lees and the Botanical Record Club, and since the demise of that organisation he has continued to devote a good deal of his spare time to the elucidation of the local Flora with most valuable results. Several of the new county records mentioned by Mr. Lees have been long known to Mr. Wilson or me as integers in the florula of V.C. 60, some of them from numerous stations. With a view to enlisting further aid we are about to publish a list of species not recorded in 'Topographical Botany' or the Botanical Record Club Reports.

Rubus radula, mentioned incidentally under *R. rusticanus* in Mr. Lees' paper, appears to be a new county record, although attention is not called to the fact. This species does not appear in 'Topographical Botany,' nor in Mr. Rogers' more recent census list of these plants published in the 'Journal of Botany.' It must be exceedingly local in West Lancashire, where the more glandulose Rubi are represented chiefly by *Rubus dasyphyllus* Rogers, and forms of *R. hystrix* and *R. dumetorum.*

Hippuris vulgaris is recorded for V.C. 60 in 'Topographical Botany,' and the following species, also marked N.C.R. by Mr. Lees, were published in 1891 in the 'Flora of the Stonyhurst District':—

Filago germanica.
Calamintha clinopodium.
Scirpus lacustris.
Juncus diffusus.

Carex ampullacea was recorded from Garstang in the Botanical Record Club Report for 1881-2 by Mr. A. Wilson.

The island of Walney is not a portion of West Lancashire (60), as appears to be implied in Mr. Lees' opening remarks.

NOTE—LEPIDOPTERA.

***Sphinx convolvuli* at Bradford.**—In the last week in September a specimen of *S. convolvuli* was taken here in a busy part of the town, while at rest under a 'coal drop.' It was kept alive for a week and fed with bread! therefore its condition is such as might be expected—a bald and battered creature. It was sent to me alive, but useless. It is many years since one was recorded for this district.—J. W. CARTER, Manningham, Bradford, 12th October 1899.

NOTE—COLEOPTERA.

***Pyrochroa serraticornis* in Cumberland.**—In the 'Naturalist' for 1896, p. 210, a Bradford correspondent records the occurrence of this beetle near Ripley, and asks if it has been taken further north. Perhaps it may be of interest to him and others to know that it occurs, though sparingly, as far north as Cumberland. Three years ago I had two specimens brought me by a rural postman, which were found by him in a country lane near Burgh-by-Sands, from where the blue hills of southern Scotland are visible across the shimmering waters of the Solway. This year it has occurred at Salkeld, near Penrith. It was also taken many years ago by Mr. T. C. Heysham, near the village of Cummersdale, and recorded in Stephens' 'Illustrations' under the name of *P. rubens*.—JAS. MURRAY, 11, Close Street, Carlisle, 24th October 1899.

NOTE—DIPTERA.

Abundance of the Celery Fly.—During the past season this beautiful dipteron (*Tephritis onopordinis* Curtis) has occurred in this district in excessive numbers, so much so, indeed, that it may truly be regarded as a destructive pest. In the gardens of my friends, Mr. F. Rhodes, of Undercliffe, and Mr. F. Jowett, of Gilstead, every leaf on every plant of celery in the trenches bore the characteristic brown blotch, in early September, and now not a leaf remains on the plants; and as a consequence of the powers of assimilation being cut short, the celery has suffered severely. In the garden last mentioned, although my friend has been there for several years and annually grown celery, he has not before been plagued with the 'fly.' From other gardens which I have not seen comes the same woeful tale of destruction. The larvæ evidently mostly enter the ground to pupate, as the light-brown or ochrous oval pupa cases may be gathered in hundreds at the present time.—J. W. CARTER, Manningham, Bradford, 10th October 1899.

WEST LANCASTER INDIGENES.

F. ARNOLD LEES, M.R.C.S.,
Leeds.

RECENTLY, going over some vouching specimens of plants collected in 1887 by Mr. Alfred Wilson, and sent for notification in a report of the now defunct Record Club (never published), I find some important species whose localities are not, I believe, in print. These form a fitting supplement to my notes for the same Vice-county (60), found in another place.

Drosera anglica. Cockerham Moss, August 1887.

Galium uliginosum. Between Borwick and Yealand Conyers, July 1887.

Thrincia hirta DC. Banks, near the sea, between Pilling and Cockerham, 1887.

Carduus heterophyllus. Swampy wood by stream, Lower Salter, Roeburndale, 1887.

Polygonatum multiflorum! Native (unlike the circumstances under which it occurs in lowland woods) in rocky, limestone-soil woods at Yealand Storrs, June 1887.

Rhynchospora alba. Cockerham Moss.

Carex limosa. Cockerham Moss, August 1887.

Triticum caninum! Roeburndale river-side.

All the above eight are New Vice-county records.

Ranunculus submersus Hiern. Pool near Silverdale (on limestone), May 1888. *Trichophyllus*-like, truly, in aspect, but tassels, flower- and seed-heads rather too bulky; and it is more than probable this would be found to produce heterophyllan floating-leaves later in the year. May is a bad month for collecting nameable Batrachian Ranunculi.

Actæa spicata L. Limestone rock-ledge on the almost perpendicular side of one of the 'Pot-Holes' on Leck Fell, altitude about 1,200 feet. Quite out of reach, being about 50 feet below the level of the moor. None seen nearer the surface (it likes shelter, and in quite exposed situations will die out. It is probably bird-sown in all the crevices, etc., wherein it grows on tree-bare pavements like that at Malham; in one sense a relic of a long gone silvan

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flora, unless the bird-sown theory be sound). Seen (by Mr. Wilson) on three different occasions during the years 1883 to 1888, who is quite sure it is the true plant, being familiar with its facies in other localities. The nearest known station in Kingsdale (W. Yorks.) is not above three or four miles as the crow flies.

Festuca elatior L., a. ***majus*** (type)! Near Melling, July 1888.

Festuca sylvatica L. (*Calamaria*). Mr. Wilson also sent me a specimen of this, from a wood near Leck, but I have mislaid it somewhere.

Epilobium angustifolium L. Leck Fell, on calcareous rocks, altitude 1,280 feet, July 1888.

Scleranthus annuus L. Field near Garstang, July 1888.

Helosciadium inundatum Koch. Marshy pool near Yealand, along with *Nuphar lutea*, July 1888.

Helminthia echioides Gaert. Clay banks by sea, between Naze Point and Lytham, July 1888.

Carex lævigata Sm. Swampy woods by river Calder, near Garstang.

Rosa tomentosa Sm. (*pseudo-mollis* E. G. B.). Near Garstang, September 1888. Bush five to seven feet high, arching. Flowers deep rose colour.

Rosa mollis Sm. Banks of Calder near Garstang, September 1888. (The type, with connivent fruiting sepals, and smooth globose heps.)

Rosa mollis Sm. (*glabrata* Fries?). Hedges at Leck, July 1888. Nearly glabrous long-oval leaflets, prickly small sphærical fruit, nearly straight long-based prickles. Bushes three to five feet high, scarcely arching.

Potamogeton natans L. Type. Ponds near Garstang, very abundant; all over the Fylde plain in nearly all the pools below 200 feet.

Stachys arvensis L. Field near Silverdale, May 1888. 'This is very rare in West Lancaster Vice-county.'

Tilia parvifolia L. (*cordata* Miller). N.C.R. Quite wild and flowering well, in rocky woods on limestone near Warton. One of the most interesting of Mr. Wilson's additions to our knowledge of the range of our native woodland trees.

NEW AND CRITICAL BRITISH FUNGI FOUND IN WEST YORKSHIRE.

CHAS. CROSSLAND, F.L.S.,
Halifax.

THIS paper embraces ten species; three new to science, with plate; six new to Britain, accompanied by additional notes; and one critical species, *Barlæa Persoonii* (Crouan) is discussed. Of the three new species *Lactarius glaucescens* is a well-marked member of the Lactarius group. I take the opportunity of dedicating a new *Thielavia* to the late Mr. H. T. Soppitt, its discoverer; an ardent and painstaking mycologist, also an original investigator into some of the problems connected with the Uredinaceæ.

It may be explained that the total length of the ascus is given. Some authors give the length of the 'spore-bearing portion,' which appears to be a rather unsatisfactory method, as the spores take up varying space, and occupy different altitudes in the ascus according to the age and development of both.

Lactarius glaucescens sp. nov. Lac acre, ex alba glaucescens.

Pileus carnosus, rigidus, 4-6 cm. latus, convexo umbilicato-depressus, levis, glaber, siccus, azonus, albidus vel cremoricolor, maculas parvas ochraceo-albus ornatus, margine involuto, exstriio; caro albida, compacta, circa 8 mm. crassa, ad margine 2 mm. crassa; lamellæ adfixæ, confertæ, 18-20 in 1 cm. hic inde furcatæ, angustæ, 1·5 mm. latæ, pileo concolorae; stipes 2·5-3 cm. long. × 1·25 cm. crass. solidus, sursum incrassatus, levis, compactus, pileo concolor; sporæ hyalinæ, globosæ, minutissime echinulatæ, 6-7 μ diam.; cystidia cylindrica vel subclavata, intus granulosa, 50-60 × 7-8 μ; lac copiosum, acrum, ex albo glaucescens.

Hab.—Wade Wood, Luddenden-dean, near Halifax, August 1899. Coll. James Needham.

Distinguished more especially by the white, at length glaucous-green, colour of the milk, and the very narrow, densely-crowded gills. The fresh-cut surface of the stem and pileus is immediately suffused with milk, which is so copious and cohesive that the two halves of the sporophore will cohere firmly together if replaced. The drying of the coagulated milk on the cut surface imparts to the pale cream-coloured flesh a glaucous appearance. Soon after being placed in a 4-5 per

cent. solution of formaline the cut surface of both pileus and stem turns bright blue, as do also the hardened drops of milk which have exuded from fractures in the gills. The hymenium is sprinkled with cystidia, the contents of which are densely granular. The cystidia stand 25-30 μ above the apices of the basidia, and descend into the subhymenial layer, where a septum cuts off the portion with the granular contents; below the septum the cystidia-bearing hyphæ are free from granules.

Belonium pilosum sp. nov.

Apothecia sessilia, scutellata, aquosa, extus margineque papillosa-pilosa, subiculum nullum; sporæ cylindrico-fusiformæ hyalinæ glabræ, 3-septatæ.

Apothecia sparsa, gregaria, vel cæspitosa aggregata et difformia, sessilia, e subglobosa explanata, margine elevato, albida, papilloso-fimbriata, 1-1·5 rarius 2 mm. lata, extus margineque piloso-papillosa, supra argenteo-cinerea, basi fuscescens, pili clavati, 1-2-septati, 25-30 × 8-10 μ pallide brunnei, apice hyalini, disco læte cinerea vel atro-cinerea; hypothecium e filamentis tenuis contextum e basi ad marginem radiantes, excipulum cellulis sub-globosis, 7-9 μ diam.; asci cylindraceo-clavati, apice attenuati, rotundati, incrassati, iodo tincti, octospori, 70-80 × 8 μ; sporæ supra distichæ, infra monostichæ, hyalinæ, fusiformæ vel cylindraceo-fusiformæ, rectæ vel leniter curvulæ, 3-septatæ, 18-24 × 2-5 μ; paraphyses cylindraceæ, 3·3-5 μ crassæ.

Hab.—On one year old stems and leaves of *Carex pendula*. Elland, near Halifax, May 1899.

The ascophores are attached to the matrix by about one-fifth their diameter. In well-grown specimens the margin is sometimes undulate. The spreading of the white, marginal, short, clavate hairs is very fine; these clavate hairs are continued in a scattered manner for some distance down the side of the ascophore. When dry the ascophores are firm, hard, and dark grey, and the margin curves inwards. The spores, when first formed, fill the ascus; later, the ascus enlarges a little, and the eight spores gather almost into a fascicle near its apex immediately prior to being shot forth; the force of the expulsion in water carries them, en masse, about the length of the ascus. The asci contract a little after expelling the spores. The spores at first contain 6-10 globules, later the contents become homogeneous, and finally separate into four portions; they contract a little on being treated with iodine, but the three septa become more apparent. The apical plug of the ascus at the same time is faintly tinged blue.

Thielavia. Zoph. in Verhand. Bot. Ver. Brandens. 1876, p. 101.

Thielavia Soppittii sp. nov. Perithecia sparsa vel subgregaria, superficialia, astoma, subglobosa, rufo-brunnea, fragili-membranacea, 250 μ alta; asci ellipsoidei vel ovati, evanescenti, 56-60 × 35 μ, octospori; sporæ inordinatæ, subellipsoideæ, inæquilateralæ, subinde plano-convexæ, episporio crassæ e hyalinæ flavidæ, dein opaco-brunneæ, intus granulosæ, 28-30 × 16 μ.

Hab.—Near the base of decaying stems of *Carduus palustris*. Norland, near Halifax, Nov. 1899. Coll. H. T. Soppitt.

Sometimes the perithecia are close together in little groups, or individuals may be widely separated; when fresh red-brown, darker when dry. The asci are completely filled with the eight spores. Longitudinal optical sections of moving spores are seen to change from subplano-convex to elliptical. Did not observe any mycelial bed, or conidia-bearing hyphæ in connection with the perithecia.

Aleuria albida Gillett, Discom., pag. 36 cum icone; ***Acetabula albida*** Sacc., Syll. VIII. n. 194.

Hab.—Warehouse yard, Halifax, June 1895; and Sept. 1896. Coll. H. T. Soppitt.

No asci or spore dimensions are given in Gillett's original description. The following notes were taken while examining freshly-collected specimens:—

Ascophores 2-3 cm. diam., disc concave, stem short, even, margin spreading, fleshy-cartilaginous (not fragile), pale wax yellow, exterior albo-furfuraceous; asci cylindrical, apex subtruncate, 200-220 × 9-10 μ, spores occupying less than half the space when mature, eight in number, obliquely uniseriate, elliptic, hyaline, smooth, indistinctly centri-nucleate, 10-12 × 7-8 μ; paraphyses linear or apex slightly swollen, septate, longer than the asci.

Our figures of the ascophores were compared with those of Gillett at the Kew Herbarium, April 1899, and were found to agree in all respects, with the exception of the stem not being costate; Gillett's are. The white scurf on the exterior consists of little heaps of loose, subglobose, thick-walled, detached cells 16-24 μ diam. Excipulum parenchymatous.

Mollisia betulicola (Fuckel) Rehm. Rabenh. Krypt. Flora, Discom. n. 5036, p. 538; ***Pyrenopeziza betulicola*** Fuckel, Symb. Myc., p. 294; Sacc. Syll. VIII. n. 1507; ***Calloria Winteri*** Kunze, Fungi sel. exs n. 283.

Hab.—On decaying birch leaves. Hebden Bridge, June 1899. Coll. James Needham.

Though the asci and spores in our specimens are rather smaller than in Rehm's, I have no doubt as to the identity of the species. Rehm's asci are 50-60 × 9-10 μ and spores 9-12 × 3 μ; Saccardo gives them as 56 × 8 μ and 8-10 × 3 μ respectively. In the Hebden Bridge specimens the asci are 40-45 × 6-7 μ and spores 8-10 × 2·5 μ, occasionally approaching 3 μ.

Ascobolus stictoideus Speg. Mich. I., p. 474; Sacc. Syll. VIII. n. 2137.

Hab.—On dogs' dung. Halifax, 4th February 1899. Coll. H. T. Soppitt.

The ascophores are almost wholly immersed in the matrix, very little more than the margin and disc being visible above the surface; the ripe extruded asci are very prominent before shooting off their spores. The spore dimensions as given in Sacc. Syll. are 25 × 14 μ. M. Boudier considers them to be 30-35 μ long. My measurements are 28-30 × 14 μ. Mr. Massee has kindly compared the Halifax material with that from Spegazzini in the Royal Herbarium, Kew, and considers them identical.

Ascobolus minutus Boud., Bull. Soc. Myc., IV., p. xlviii., t. II., f. I.; Sacc. Syll. VIII. n. 2146.

Hab.—On dogs' dung. Hebden Bridge, July 1899. Coll. James Needham.

The spores of this species are amongst the smallest met with in the genus Ascobolus; in Boudier's specimens they were 13-15 × 7-9 μ, in ours 11-14 + 6·5-7·5 μ. The asci are comparatively slender for that family, 140-170 × 13-14 Boud., ours 140-160 × 12-13; as a consequence the spores remain uniseriate until ejected, which is unusual in *Ascobolus*.

Hypocopra Serignanensis H. Fab. Sacc. Syll. I. p. 244, n. 888.

Hab.—On rabbits' dung. Hebden Bridge, October 1899. Coll. James Needham.

This differs from *H. maxima*, a British species, in the much smaller spores and longer ostiolum. *H. Serignanensis* is only previously recorded from France, occurring on a similar matrix.

Oospora coccinea (Corda) Sacc. Corda in Sturm. Deutsch. Flora, III., p. 40, 1829; Sacc. Syll. IV. n. 74, p. 21.

The following observations were taken while examining the mould:—Tufts minute, separate or confluent, brick-red to vermilion, fertile hyphæ erect or spreading, lax or intricately compact in the mass, sparingly and irregularly branched, straight or slightly wavy, paler than the conidia, 100-140 μ long by 4-6 μ thick below, thicker and somewhat moniliform above preparatory to the formation of conidia; conidia plentiful, con-

catenate, formed in basipetal succession, brick-red, perfectly globose, generally 11-13 μ, occasionally 16 μ or even 18 μ diameter, chains simple or branched, contents granular, sometimes a narrow neck exists between two conidia.

Hab.—On cats' dung. Halifax, 22nd February 1899.

Barlæa Persoonii (Crouan). ***Ascobolus Persoonii*** Crouan, Flor. Finist., p. 56; ***Peziza atro-violacea*** Del. de Seyn., Rech. Veg. Inf. III., p. 84; ***P. violascens*** Cooke, Mycogr., p. 46, f. 83; Phill. Brit. Disc., p. 88; ***Barlæa Persoonii*** Sacc. Syll. VIII., n. 438; ***B. violascens,*** Mass., Brit. Fung. Flo., Vol. IV., p. 398.

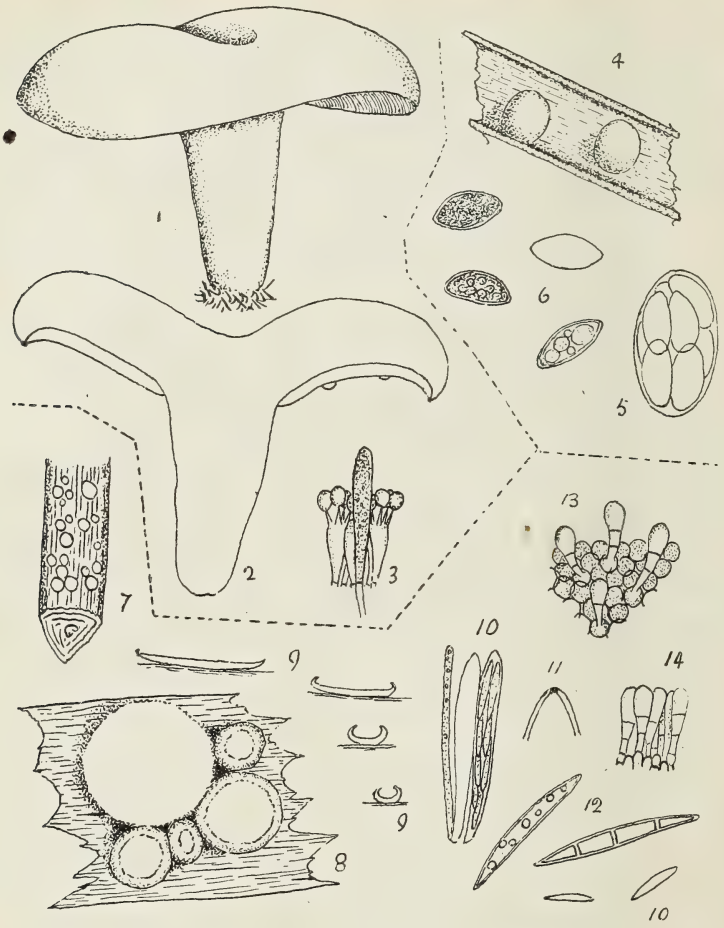
Fine specimens of what I at first took to be *Peziza violascens* Cke. were received from Mr. Needham, Hebden Bridge, July 1899. Hab., mossy ground.

On finding that the spores were distinctly rough and did not allow of its being placed under *B. violascens* (Cke.), in which the spores are stated to be smooth, I submitted specimens to Mr. Massee, who replied as follows:—

'The Peziza is typical *B. Persoonii* Sacc. I find on turning up Crouan's first description of the species that it is figured and described as having warted spores, and he called it *Ascobolus Persoonii*. There is also a specimen in the Herbarium from Crouan which agrees absolutely with yours.

'Now Cooke as well as myself had up to the present overlooked this authentic specimen, as it was put in with *Ascobolus*; and Cooke found a violet peziza which he considered to be Crouan's species, with smooth spores, and described it as such, altering the name to *Peziza violascens*. I examined Cooke's specimens and found the spores smooth, and called it *Barlæa violascens*. Saccardo also copied Cooke's description. The species must now be *Barlæa Persoonii* Sacc., and Cooke's species will have to be *B. Cookei*.'

The following notes were taken while examining the Hebden Bridge specimens:—Ascophore sessile on a narrow base, hemispherical then expanded, disc plane or undulate, 4-8 mm. across, wholly pale-dingy amethyst, glabrous, margin rather obtuse, flesh waxy-brittle, 1·5-2 mm. thick; excipulum parenchymatous, cells globose or elongated, 35-60 μ (longest diameter), hyaline, cortex thin, consisting of not more than 1-2 layers of globose cells 20 μ diam.; hypothecial cells small and almost indistinguishable in outline; asci cylindrical, 200-210 × 13-14 μ, apex rounded, pedicel narrow; spores eight, uniseriate, hyaline, spherical, rough, 1-2 guttulate, 9·5-11 μ diam.; paraphyses cylindrical, simple or branched, septate, hyaline, 3-4 μ thick, apex always curved.



EXPLANATION OF FIGURES ON PLATE.

Figs. 1-3 *Lactarius glaucescens*, fig. 1 sporophore nat. size, fig. 2 section of same, fig. 3 basidia, spores and cystidium of same × 350 diam.; figs. 4-6 *Thielavia Soppittii*, fig. 4 perithecia × 25 diam.; figs. 5-6 ascus and spores × 350 diam.; figs. 7-14 *Belonium pilosum*, fig. 7 ascophores nat. size on portion of stem of *Carex pendula*, fig. 8 ascophores × 11-12 diam., fig. 9 sections of same, fig. 10 asci, paraphyses and spores × 350 diam., fig. 11 apex of ascus after being treated with iodine + 1000-1100 diam., fig. 12 spores × 1000-1100 diam., fig. 13 external hairs × 350 diam., fig. 14 marginal hairs × 350 diam. All from nature, del. C. Crossland.

Naturalist,

ESSEX VERTEBRATES.

Essex Field Club Special Memoirs. — Vol. III. | **The Mammals, Reptiles, | and | Fishes of Essex:** | A Contribution to | the Natural History of the County. | By | **Henry Laver,** M.R.C.S., F.S.A., F.L.S., | Vice-President of the Essex Field Club, and Senior Surgeon to the Essex and | Colchester Hospital, Colchester. | With eight full-page, and two half-page illustrations. | Chelmsford: | Edmund Durrant & Co., High Street. | Buckhurst Hill: | The Essex Field Club. | London: | Simpkin, Marshall and Co., Ltd., Stationers' Hall Court. | — | 1898. [8vo. cloth, viii. + 138 + four pages + 8 plates.]

The delay in the notice of this important and most valuable work has arisen from the great stress under which the reviewer has been considerably hindered in his work during the past two or three years.

The work is one of the Special Memoirs of the Essex Field Club, and together with Christy's Birds of Essex, forms a complete account of the Vertebrata of that county.

Mr. Laver has long devoted attention to the subject, and has treated it in a most masterly manner, the book abounding in valuable notes and observations of all kinds, although no attempt is made to enter into minute details of distribution. Historical records are carefully noted, as are also interesting details as to habits and variation.

The book includes records for 38 terrestrial and 10 marine mammals, 4 reptiles, 6 amphibians, and 113 marine and fresh-water fishes, and in the introduction interesting comparisons are made with the Norfolk and the Yorkshire lists.

In the introduction are also given fish-lists for each of the Essex rivers, and accounts of the fisheries, both sea and fresh-water.

An appendix gives a long list of works and papers used in the preparation of the book, and a list of subscribers concludes it.

The illustrations are partly devoted to views of mammalian haunts in the Forest of Epping, such as those of such characteristic forest animals as the Badger, Fox, and Deer. Others show fine heads of Fallow and Red Deer, and one plate represents a Common Rorqual captured in the river Crouch. A Jackal caught in Ongar Woods is illustrated, and two plates are views of coast scenery.

Space forbids our entering into the countless matters of interest which the book suggests, and it only remains to congratulate the author on his success, and the Essex Field Club on their enterprise in publishing so excellent a book.

1900 January 3.

NOTE—NEUROPTERA.

***Hemerobius concinnus* near Selby.**—The Rev. C. D. Ash sent me a specimen of the brown form of this local species, which he had taken at Skipwith this year.—GEO. T. PORRITT, Crosland Hall, Huddersfield, 20th December 1899.

NOTE—FUNGI.

***Volvaria parvula* at Campsall.**—I have to record an omission from my list of fungi found at the Yorkshire Fungus Foray, published in 'The Naturalist' for December, pp. 367-372. This is an interesting species—*Volvaria parvula* Fr.—found at Campsall by Mr. Thomas Gibbs.—CHARLES CROSSLAND, Halifax, 7th December 1899.

NOTE—TRICHOPTERA.

***Limnophilus luridus* and *Molanna angustata* at Huddersfield.**—On 20th June last, I was somewhat surprised to find *Limnophilus luridus* in some plenty about the walls on the Harden Moss Moors, and recently Mr. B. Morley sent me *Molanna angustata* from Clayton West. Both species are new to the Huddersfield district, and *L. luridus* to West Yorkshire.—GEO. T. PORRITT, Crosland Hall, Huddersfield, 20th December 1899.

NOTE—COLEOPTERA.

***Cyllene crinicornis* at Retford.**—A specimen of this pretty Central American Longicorn Beetle (*Cyllene crinicornis* Chevrolat) was taken alive in Retford Station in September last, and came into the possession of Mr. Stephen Pegler, of Retford. It bears a superficial resemblance to *Clytus arcuatus*, one of the rarer 'Wasp Beetles.' No doubt the specimen was introduced in timber.—ALFRED THORNLEY, South Leverton Vicarage, Lincoln, 8th December 1899.

BOOK NOTICES.

We have received through the kindness of Mr. **Arthur Bennett,** F.L.S., a reprint of his paper in the October Annals of Scottish Natural History on **'Hierochloa borealis** R.&S., **as a Scottish Species,'** which includes much detail on its general range.

We have before us the **'Transactions of the Hull Scientific and Field Naturalists' Club for the year 1899.** Vol. I. No. II.,' which was published on the 1st of December, and is edited by Messrs. Thomas Sheppard and J. R. Boyle, F.S.A., and we have again the satisfactory task of congratulating them and the Society on the excellence of their work. There is not a single note or paper which does not refer to the Club's own proper sphere of operations, and the needful element of humour is supplied by the little poem by Mr. R. H. P[hilip] at the end, in which the colossal and superhuman attainments of the 'average [Hull] member' are set forth. The papers include articles on the Hull Water Supply, by the Rev. H. P. Slade; the Chalk Water Supply of Yorkshire, by Mr. J. R. Mortimer; the Contents and Origin of the Gravels around Hull, by Mr. T. Sheppard; a Bronze Celt recently found in Holderness, by the same; Mr. William Morfitt's Reminiscences of a Whale Hunt at Goole over 30 years ago; Mr. J. J. Marshall on the Mosses of the East Riding; a List of the Lepidoptera of the Hull 8-mile district, by Mr. J. W. Boult; Notes on the Progress made by the Club during 1898-9, and a paper on a Fragment of the Early History of Spurn, by Mr. J. R. Boyle; in addition to about eight small notes of various kinds. The process frontispiece represents the gravel pits at Burstwick and Kelsey Hill.

LAND AND FRESHWATER MOLLUSCA OBSERVED NEAR TADCASTER.

FRANCIS G. BINNIE.

[The following notes have been in my possession since the year 1880, and it seems useful to print them, inasmuch as they refer to a district which was keenly explored by Mr. Binnie during his residence there, and which has (with the exception of the vicinity of Boston Spa, so closely searched by Mr. John Emmet) only been cursorily examined by conchologists since.—W. D. R.]

Localities are given for even the commonest species.

Those enclosed within [ ] are not strictly within the limits of the district [i.e., the Wharfe drainage basin], but belong to closely adjacent parts of the Ainsty.

By the term 'Boston Spa,' so frequently used in this list, I designate the steep wooded bank of the river Wharfe extending from the road leading past the church upwards to Jackdaw Crag, and the strip alongside the road going from this point towards the main road.

Sphærium corneum. Beck in Smaw's Ings, Tadcaster.

Sphærium lacustre. Small pond near Tadcaster; pond between Wighill and Healaugh. [Not unfrequent in ponds in the Ainsty.]

Pisidium amnicum. River Wharfe, Boston Spa, and Tadcaster.

[***Bythinia tentaculata.*** Dead shells among mud, etc., thrown out of the Foss beck near Catterton.]

Valvata cristata. Pond near Healaugh Hall, Tadcaster. [Generally distributed in ponds in the Ainsty.]

[***Planorbis fontanus*** Lightf. Ponds near Healaugh and Bilbrough.]

Planorbis nautileus. Ponds near Tadcaster; pond near Jackson Wood, to the east of Wetherby.

Var. ***cristata*** (rarer than type). Tadcaster.

Planorbis albus. Tadcaster.

Planorbis spirorbis. Newton Kyme; Wighill; Tadcaster.

Planorbis complanatus. Tadcaster; Wighill; pond near Jackson Wood, Wetherby.

Planorbis contortus. Tadcaster; Wighill.

1900 January 3.

Physa hypnorum. Wighill; [Shireoaks Wood, Tadcaster; Catterton, Healaugh, Bilbrough, etc., in Ainsty].

Limnæa peregra. Tadcaster; Wighill; Wetherby.

VAR. ***ovata.*** Tadcaster.

Limnæa palustris. Beck in Smaw's Ings, Tadcaster.

Limnæa truncatula. Ponds, etc., in Ainsty, near Tadcaster; Wighill; pond near Wetherby.

Limnæa glabra. Several ponds and ditches in the Ainsty, near Tadcaster; Wighill.

[***Ancylus lacustris.*** Pond a mile and a half to the N.E. of Tadcaster; it is not unfrequent in ponds in the Ainsty.]

Arion ater. Boston Spa; Tadcaster.

Arion hortensis. Boston Spa; Tadcaster; Wighill.

Limax agrestis. Knaresborough; Thorp Arch; Boston Spa; Newton Kyme; Wighill; Tadcaster.

Limax lævis (***brunneus***). Wet places, Tadcaster and Wighill [and other localities in Ainsty].

Limax arborum. Boston Spa. [Shireoaks Wood, near Tadcaster].

Limax maximus. Boston Spa; Tadcaster.

Succinea putris. Tadcaster.

Vitrina pellucida. Boston Spa; Thorp Arch; Newton Kyme; Tadcaster.

Zonites cellarius. Knaresborough; Thorp Arch; Boston Spa; Tadcaster.

Zonites glaber. Boston Spa; Newton Kyme; Tadcaster, both on and off limestone tract.

Zonites alliarius. Knaresborough; Boston Spa; Thorp Arch; Tadcaster.

Zonites nitidulus. Knaresborough; Boston Spa; Thorp Arch; west of Walton; Tadcaster.

Zonites purus. Boston Spa; Tadcaster; Oxton.

VAR. ***margaritacea.*** Boston Spa.

Zonites crystallinus. Boston Spa; Tadcaster.

Helix aspersa. Knaresborough; Wetherby; Boston Spa; Newton Kyme; Tadcaster.

Helix nemoralis (type). Wetherby; Boston Spa; Thorp Arch; Tadcaster.

Helix hortensis. Knaresborough; between Wetherby and Collingham; Boston Spa; Tadcaster.

VAR. ***hybrida.*** Boston Spa.

Helix arbustorum. Boston Spa; one empty shell in limestone quarry near Tadcaster.

Helix cantiana. Between Wetherby and Collingham; Boston Spa; Tadcaster; Sherburn.

Helix rufescens. Knaresborough; Boston Spa; Tadcaster.

VAR. ***albida.*** In limestone quarry near Tadcaster.

Helix hispida. Knaresborough; Boston Spa; Thorp Arch; Wighill; Tadcaster.

Helix concinna. Knaresborough; Boston Spa; Wighill; Tadcaster.

Helix fusca. Boston Spa.

Helix fulva. Boston Spa; Tadcaster.

Helix aculeata. Boston Spa; Tadcaster.

Helix virgata. Tadcaster, on limestone tract; Sherburn, off the limestone, but along a road macamadised with that stone, plentiful.

Helix caperata. Knaresborough; Wetherby; Boston Spa; Tadcaster.

VAR. ***subscalaris.*** Grimbald Crag, Knaresborough.

VAR. ***ornata.*** Tadcaster, on limestone tract.

Helix ericetorum. Knaresborough; an empty shell at Boston Spa; Newton Kyme; Tadcaster.

VAR. ***alba.*** Tadcaster, along with type.

Helix rotundata. Knaresborough; Wetherby; Boston Spa; Tadcaster.

[VAR. ***alba.*** Shireoaks Wood, Tadcaster.]

Helix pygmæa. Boston Spa; Tadcaster.

Helix pulchella. Knaresborough; Wetherby; Spofforth; Newton Kyme; Bramham; Tadcaster.

VAR. ***costata.*** Wetherby; Spofforth; Tadcaster.

Helix lapicida. Grimbald Crag, Knaresborough; Boston Spa (one empty shell).

Bulimus obscurus. Knaresborough; Thorp Arch; Boston Spa; Tadcaster (on limestone tract).

1900 January 3.

Pupa umbilicata. Knaresborough; Wetherby; Boston Spa; Tadcaster.

Vertigo pusilla. Three specimens under ivy on the top of a limestone wall between Spofforth and Wetherby.

Clausilia rugosa. Wetherby; Thorp Arch; Boston Spa; Bramham; Tadcaster.

VAR. ***everetti.*** Wetherby; Boston Spa; Tadcaster.

VAR. ***tumidula.*** Wetherby; Boston Spa; Tadcaster.

Clausilia laminata. Boston Spa.

Azeca tridens. Boston Spa; small wood and also in a limestone quarry near Tadcaster.

Zua lubrica. Thorp Arch; Boston Spa; Bramham; Tadcaster.

Achatina acicula. Boston Spa; Tadcaster, on limestone tract. Always empty shells.

Carychium minimum. Boston Spa. [Shireoaks Wood, near Tadcaster.]

Cyclostoma elegans. Boston Spa.

NOTES—LEPIDOPTERA.

***Acronycta aceris* at Doncaster: an Addition to the Yorkshire List of Lepidoptera.**—Mr. L. S. Brady, of Sheffield, informed me he found a larva, undoubtedly of *Acronycta aceris,* in Wadworth Wood, near Doncaster, during the first week of August last, making the first record for the species in the county.—GEO. T. PORRITT, Crosland Hall, Huddersfield, 20th December 1899.

***Mamestra abjecta* and *Epunda lutulenta* in Yorkshire.**—Both these species, of rare occurrence in the county, have been taken during the past season at Middlesbrough by Mr. T. A. Lofthouse. Of *M. abjecta* only several specimens occurred, but *E. lutulenta* was not uncommon, in both cases 'at sugar in the garden.' *E. lutulenta* was previously only recorded from York many years ago. *M. abjecta* has also been taken during the past season at Skipwith, near Selby, by the Rev. C. D. Ash.—GEO. T. PORRITT, Crosland Hall, Huddersfield, 20th December 1899.

Unusual Abundance of *Vanessa atalanta* and *Macroglossa stellatarum* in Yorkshire.—It may be as well to place on record that these two species were unusually plentiful in Yorkshire, as in other parts of the country, during the past season. *V. atalanta* appears to have been greatly in evidence everywhere, but *M. stellatarum,* though scattered all over the county, was probably nowhere in the profusion in which it occurred in the southern counties. Both species formed a pretty feature about the flowers in my own garden, where also another butterfly, *Vanessa io,* now rarely seen in the Huddersfield district, occurred, though it was very scarce as compared with *V. atalanta.* Mr. Thomas Bunker sent me two larvæ of *Acherontia atropos* from Goole, with the information that they were not uncommon in the potato fields there this season.—GEO. T. PORRITT, Crosland Hall, Huddersfield, 27th December 1899.

BIRDS OF SPALDING AND THE SOUTH LINCOLNSHIRE FENLAND.

The Late T. J. H. BROGDEN,
Spalding.
Arranged from his Manuscripts by John Cordeaux.

This list of the Birds of the South Lincolnshire Fenland is from notes supplied by the late Mr. Brogden for the Lincolnshire Naturalists' Union, of which he was a member. As Secretary to the Vertebrate Zoology Section, my task has been to transcribe, arrange in order, and add the scientific nomenclature.

In the preface to his notebook Mr. Brogden writes:—'This is a rough list of the avifauna of the 18th Division (Spalding and Holbeach) of the Natural History Map of Lincolnshire [Rev. E. Adrian Woodruffe-Peacock] which have come under my notice during the last few years [1886-1896], with remarks thereon.'

In the catalogue of Mr. Brogden's sale his collection of eggs is spoken of 'as one of the finest collections of British birds' eggs ever collected in the British Isles by an amateur, including about 236 varieties.' John Cordeaux.

Turdus viscivorus Linnæus. **Mistletoe-Thrush.** Generally distributed, breeding early; appears to have considerably decreased in numbers of late years.

Turdus musicus L. **Song-Thrush.** Found in the spring, breeding everywhere in the district.

Turdus iliacus L. **Redwing.** Perhaps more numerous than the Fieldfare during the winter. Appears to have a habit of migrating at night, particularly on stormy nights, when numbers may be heard passing overhead uttering their peculiarly screechy call, probably to keep the flock together. Numbers perished during the severe weather of January and February 1895. I have a cream-coloured specimen, shot in November 1887 in the parish of Whaplode.

Turdus pilaris L. **Fieldfare.** A very plentiful winter immigrant.

Turdus merula L. **Blackbird.** Common, breeding generally in every parish.

Turdus torquatus L. **Ring-Ouzel.** A straggling spring and autumnal visitor, very seldom breeding here. I had several in my garden in Spalding in the autumn of 1894 feeding on the mountain ash berries.

Saxicola œnanthe (L.). **Wheatear.** Only appears in the spring and autumn migrations.

Pratincola rubetra (L.). **Whinchat.** An annual visitor; breeds regularly, and is fairly numerous.

Pratincola rubicola (L.). **Stonechat.** A few pairs appear and breed occasionally.

Ruticilla phœnicurus (L.). **Redstart.** Occurs very sparingly in the autumn.

Erithacus rubecula (L.). **Redbreast.** Another bird generally distributed and also apparently decreasing in numbers. The eggs are subject to great variation, some quite white, others hardly distinguishable from swallow's, and again others are very similar to those of a red-backed shrike.

Daulias luscinia (L.). **Nightingale.** Several have appeared in Spalding during the last two years, and one is supposed to have bred also in the neighbourhood of Holbeach.

Sylvia cinerea (Bechstein). **Whitethroat.** Not nearly so plentiful as one would anticipate; breeds very sparingly.

Sylvia curruca (L.). **Lesser Whitethroat.** Comparatively rare. I have only found one nest in this district.

Sylvia atricapilla (L.). **Blackcap.** A few pairs breed annually, but appear more numerous in the autumn.

Sylvia hortensis (Bechstein). **Garden Warbler.** Breeds generally in fair numbers every year throughout the district.

Regulus cristatus K. L. Koch. **Golden-crested Wren.** Have found it breeding almost annually in Spalding, but it is most numerous in the autumn migration.

Phylloscopus rufus (Bechstein). **Chiffchaff.** I have only found it during the spring and autumn migrations.

Phylloscopus trochilus (L.). **Willow Wren.** Like the above.

Acrocephalus streperus (Vieillot). **Reed Warbler.** Is fairly plentiful. I counted five nests with eggs round one pond in the first week in June 1895. I got a Cuckoo's egg from a nest in this pond; also a Cuckoo's egg from a Sedge-warbler's nest at the same place.

Acrocephalus phragmitis (Bechstein). **Sedge Warbler.** Breeds throughout the district in suitable places.

Accentor modularis (L.). **Hedge Sparrow.** Generally distributed throughout the district, breeding early; appears to be decreasing in numbers.

Acredula rosea (Blyth). **British Long-tailed Titmouse.** Seldom breeds, but occurs in small flocks in the autumn.

Parus major L. **Great Titmouse.** This and the next are the commonest of titmice, breeding wherever the locality is suitable.

Parus cæruleus L. **Blue Tit.** As the above.

Parus britannicus Sharpe & Dresser. **British Coal Titmouse.** Fairly numerous in the autumn ; I have found it breeding near Spalding.

Parus palustris L. **Marsh Titmouse.** Uncommon, but breeds now and then.

Sitta cæsia Wolf. **Nuthatch.** A casual visitor ; I have not heard of it breeding, but have seen them in the neighbourhood of Spalding in a particularly suitable locality.

Troglodytes parvulus Koch. **Wren.** Is generally distributed and breeds throughout the district.

Certhia familiaris L. **Tree-Creeper.** To be found generally and breeding, is more particularly plentiful about Spalding.

Motacilla lugubris Temminck. **Pied Wagtail.** Rather uncommon than otherwise and breeds sparingly.

Motacilla melanope Pallas. **Grey Wagtail.** Of very casual occurrence.

Motacilla borealis Sundevall. **Grey-headed Wagtail.** The only birds I have come across of this species are a pair in December 1895.

Motacilla raii (Bonaparte). **Yellow Wagtail.** The commonest of all the wagtails ; breeds regularly every year in numbers.

Anthus pratensis (L.). **Meadow Pipit.** Is generally distributed and breeding throughout the district. I have a cream-coloured specimen shot in Spalding, September 1896.

Lanius excubitor L. **Great Grey Shrike.** I have only known of two occurrences in the district, one shot near Cowbit, the other I saw, a fine specimen, shot at Moulton.

Ampelis garrulus L. **Waxwing.** A rare visitor, but several specimens have been taken and observed in late years. In December 1895 one was seen in company with a Hawfinch on a yew hedge in a garden at Spalding.

Muscicapa grisola L. **Spotted Flycatcher.** An annual summer visitor throughout the district, breeding annually.

About 1888 I found a nest in a Spalding garden with five eggs, the ground colour like a Wheatear's, but somewhat greener. Some had no marks, but one or two a large blotch of almost blood red. A pair bred in the same place next year, and the eggs were similarly coloured and marked.

Hirundo rustica L. **Swallow.** Found generally, but not so numerous as a few years ago, when thousands perished by the severe weather in May. On the 6th November 1896, when Snipe shooting in Cowbit Wash, I had a Swallow flying round me hawking for flies.

Chelidon urbica (L.). **House Martin.** In less numbers than the former.

Cotile riparia (L.). **Sand Martin.** The most common of the class, and in suitable localities breeds in large numbers.

Ligurinus chloris (L.). **Greenfinch.** Plentiful and breeds everywhere.

Coccothraustes vulgaris Pallas. **Hawfinch.** Several specimens were seen and obtained in Spalding last winter (1895). My example was picked up dead in a garden in High Street in November 1895, and another brought to me shot in Ayscoughfee Hall gardens in February 1896, and in March I also picked up another dead in the same place.

Carduelis elegans Stephens. **Goldfinch.** To be found generally and in increasing numbers. I know of several gardens in Spalding in which it breeds.

Carduelis spinus (L.). **Siskin.** In the winter of 1890 I saw seven feeding on a thistle on the Cowbit road in Spalding, within half a mile of the Market Place. They were so tame as to permit me to approach within three yards before flying away.

Passer domesticus (L.). **House Sparrow.** Has become a pest, especially to the farmers, who have formed Sparrow Clubs, offering rewards for the eggs and birds. Only last year I saw a large field of wheat in this district quite half of which was absolutely destroyed. White and also black specimens are of frequent occurrence.

Passer montanus (L.). **Tree Sparrow.** Sparingly distributed and breeding in suitable localities; is fairly numerous about Spalding.

Fringilla cœlebs L. **Chaffinch.** Breeds and is found everywhere, but is particularly numerous in autumn and winter.

Fringilla montifringilla L. **Brambling.** Plentiful in winter, more particularly in the immediate neighbourhood of Spalding.

Linota cannabina (L.). **Linnet.** Thinly distributed and breeding, is more plentiful in the mustard-growing portions of the district.

Linota rufescens (Vieillot). **Lesser Redpoll.** Thinly distributed and breeding sparingly; have found nests in Weston, Spalding, and Cowbit.

Linota flavirostris (L.) **Twite.** A casual winter visitor.

Pyrrhula europæa Vieillot. **Bullfinch.** A casual visitor, breeding sometimes.

Emberiza miliaria L. **Corn Bunting.** Distributed throughout the district and breeding.

Emberiza citrinella L. **Yellow Bunting.** Common and breeding throughout the district.

Emberiza schæniclus L. **Reed Bunting.** Plentiful, and breeding in all suitable localities.

Plectrophenax nivalis (L.). **Snow Bunting.** Occurs annually in winter.

Calcarius lapponicus (L.). **Lapland Bunting.** Occurred sparingly in the out marshes during January 1895. I obtained two specimens, a male and female, also a male and female presented to the Natural History Museum, South Kensington, and a female to the Leicester Museum. I never came across two together, and obtained all my specimens singly. They are extremely like Reed Buntings in winter plumage.

Sturnus vulgaris L. **Starling.** Found everywhere, thousands together; breeding generally.

Garrulus glandarius (L.). **Jay.** A casual visitor, seldom nesting.

Pica rustica (Scopoli). **Magpie.** Thinly distributed, breeding variously throughout the district.

Corvus monedula L. **Daw.** To be found generally, but has visibly decreased, particularly in the immediate neighbourhood of Spalding.

Corvus frugilegus L. **Rook.** Nests numerously in almost every suitable locality.

Corvus corone L. **Carrion-Crow.** To be found throughout the district breeding regularly, and appears annually to increase in numbers.

Corvus cornix L. **Hooded Crow.** Also found throughout the district in considerable numbers during the winter; occasionally breeds.

Alauda arvensis L. **Sky Lark.** Very numerous everywhere, and breeds regularly.

Otocorys alpestris (L.). **Shore Lark.** Occurs in winter on the coast portion of the district in severe weather. Can easily be identified on the wing by the conspicuous whiteness of the axillary feather.

Cypselus apus (L.). **Swift.** Numerous, particularly about the larger towns and villages.

Caprimulgus europæus (L.). **Nightjar.** An occasional autumnal visitor; does not breed.

Iynx torquilla L. **Wryneck.** Breeds annually in several portions of the district, notably Whaplode and Spalding.

Gecinus viridis (L.). **Green Woodpecker.** A casual visitor, except in the neighbourhood of Spalding, where it occasionally breeds. My specimen I got in Spalding Marsh.

Dendrocopus major (L.). **Great Spotted Woodpecker.** The same may be said of this as the preceding.

Dendrocopus minor (L.). **Lesser Spotted Woodpecker.** Breeds annually in small numbers in the neighbourhood of Spalding.

Alcedo ispida L. **Kingfisher.** To be found in small, but in late years in increasing, numbers; breeds.

Cuculus canorus L. **Cuckoo.** Annual visitor, particularly numerous in 1896. I have found the eggs in the nests of Meadow Pipits, Yellow Buntings, Pied Wagtails, and Sedge and Reed Warblers; in the two latter the nests were not twenty yards apart round the same pond. All the eggs resembled one another, a greyish brown, not unlike a Sky-Lark, only not quite so large or pointed at the narrow end. During the week ending 31st August 1896 I have seen several young ones.

Strix flammea L. **Barn Owl.** Common, particularly round Spalding, where it has several favourite breeding places; also at Weston, Whaplode, and many other. Would be

much more numerous if so many foolish persons had not got the idea they are harmful to poultry. I am glad to say I think the idea is dying out.

Asio accipitrinus (Pallas). **Short-eared Owl.** An annual visitor, arriving about the second and third week in October. Is more plentiful some years than others; last year, 1895, I saw several during November.

Syrnium aluco (L.). **Tawny Owl.** The only example I have heard of in this division is one I saw in August 1889 near Spalding.

Buteo vulgaris Leach. **Buzzard.** In October 1894 I saw in the Spalding Marsh what I took to be one of these birds, and a friend with me, who was well acquainted with them on his grouse moor, agreed with me.

Accipiter nisus (L.). **Sparrowhawk.** Only a casual visitor, seldom breeding.

Pernis apivorus (L.). **Honey-Buzzard.** In September last year, when riding in a trap with a friend in Spalding Marsh, a very fine specimen of this bird flew over us within a few yards. One I shot some years ago is now in the Derby Museum.

Falco peregrinus Tunstall. **Peregrine.** Of annual occurrence in the autumn. I have seen it in the parishes of Surfleet, Spalding, and Holbeach. The one in my collection I obtained on the Holbeach Outmarsh when in the act of stooping on a Skylark. I also know of three specimens taken during the last few years in plover nets, when trying to carry off the decoy birds, and also of another which escaped with a decoy. They appear to migrate into the district with the Plover. One was taken alive in October 1896 at Cowbit in a plover net.

Falco tinnunculus L. **Kestrel.** Very common, and breeding regularly throughout the district.

Pandion haliaëtus (L.). **Osprey.** Reported as seen perched on the faggots used for embanking the river Welland in the Outmarsh in Holbeach parish.

Phalacrocorax carbo (L.). **Cormorant.** Fairly common, and frequently occurs inland.

Sula bassana (L.). **Gannet.** Immature birds of frequent occurrence, but full plumaged ones uncommon.

Ardea cinerea L. **Common Heron.** Still numerous in the district, although evidently not as in old days. A specimen in my collection, a male in full plumage, was shot in Holbeach Marsh, where, I am told, not many years ago there used to be a small heronry in some firs.

Botaurus stellaris (L.). **Bittern.** A rare straggler. My specimen was killed in September 1887 in Holbeach Marsh.

Anser albifrons (Scopoli). **White-fronted Goose.** The one in my collection was killed in Holbeach Marsh in January 1894. This was one of six seen—all killed. Several years ago, out of a flock of nine, I killed four with a double 12-bore and wounded another, which was followed and picked up dead.

Anser segetum (Gmelin). **Bean Goose.** A fine example was obtained in Holbeach Marsh. It had previously been wounded.

Anser brachyrhynchus Baillon. **Pink-footed Goose.** The specimen in my collection was killed in January 1895 in Holbeach Marsh. A flock of eleven Geese were put up early one January morning in 1893 out of Spalding Market Place by the gasman going his rounds to turn out the lamps; probably they belonged to this species, which is said to be commonest in the county.

Bernicla canadensis (L.). **Canada Goose.** One in my collection, killed in Cowbit Wash in January of this year, is the only one I have heard of in this district. In the latter end of April 1890 a pair of dark-coloured Geese took up their residence on Cowbit Wash, apparently with the intention of breeding, but as they would not permit a near approach I never discovered what they were. They only remained about a week.

Bernicla brenta (Pallas). **Brent Goose.** Very numerous in severe winters. In very severe weather I have found these Geese exceedingly tame; I once walked to one and shot it without its attempting to fly.

Cygnus musicus Bechstein. **Whooper.** Of annual occurrence. The one in my collection killed in Holbeach Outmarsh in December 1894 weighed just under 22 lbs.

Cygnus bewicki Yarrell. **Bewick's Swan.** When Whoopers are scarce in number these Swans seem to be plentiful, and vice versâ; my specimen was shot in Holbeach Outmarsh in January 1893.

Cygnus olor (Gmelin). **Mute Swan.** Occasionally shot on Cowbit Wash.

Tadorna cornuta (S. G. Gmelin). **Sheld-duck.** Often occurs in large numbers and occasionally breeds.

Anas boschas L. **Wild Duck.** Breeds annually, but increases in number during the winter.

Spatula clypeata (L.). **Shoveler.** Occasional visitor, sometimes breeds; has been particularly numerous this autumn, 1896.

Dafila acuta (L.). **Pintail.** As of the former, but does not breed.

Nettion crecca (L.). **Teal.** Always plentiful in early autumn; have been exceptionally plentiful this autumn (1896). A few breed.

Querquedula circia (L.). **Garganey.** A rare visitor. I have only seen one example got in Holbeach Marsh.

Mareca penelope (L.). **Wigeon.** The commonest of all our Ducks.

Fuligula ferina (L.). **Pochard.** Has decreased wonderfully in numbers in late years; occasionally breeds.

Fuligula cristata (Leach). **Tufted Duck.** Appears to have increased in numbers of late years. I have frequently seen it in company, and shot it, with the Goldeneye.

Fuligula marila (L.). **Scaup.** As a rule very common in the winter.

Clangula glaucion (L.). **Goldeneye.** Of annual occurrence, and in some seasons very common.

Harelda glacialis (L.). **Long-tailed Duck.** Until December 1895 I had not come across this duck. In that month I got two, shot in the Welland by old professional gunners, who did not know what they were.

Somateria mollissima (L.). **Eider Duck.** Now and then obtained in the Wash in Holbeach Outmarsh.

Œdemia nigra (L.). **Common Scoter.** Although not at all uncommon, I have never seen this bird as common as the Velvet Scoter.

Œdemia fusca (L.). **Velvet Scoter.** Occurs annually. During the winter of 1894-5 these birds in immature plumage were very numerous.

Mergus merganser L. **Goosander.** Occasionally shot in Holbeach Outmarsh. A professional gunner told me he

sent two to London market in February 1895 in full plumage, for which he received 1s. 6d. the pair.

Mergus serrator L. **Red-breasted Merganser.** An annual winter visitor, and frequently shot on freshwater ponds and in Cowbit Wash. Seldom obtained in full plumage.

Mergus albellus L. **Smew.** I have seen several females and immature specimens during the last four years. The one in my collection I rescued from a friend, who was taking it home to be cooked for a Wigeon.

Columba palumbus L. **Wood Pigeon.** Common throughout the district; breeds.

Columba œnas L. **Stock Dove.** Generally distributed throughout the district, although not so common as the former; breeds.

Columba livia Gmelin. **Rock Dove.** I shot a specimen in Spalding in the winter of 1887, but I have not heard of any others.

Turtur communis Selby. **Turtle Dove.** To be found in greatly increased numbers every year; breeds.

Syrrhaptes paradoxus (Pallas). **Sand Grouse.** Not seen since the immigration of 1888, when several were shot and otherwise killed. In that year, when Partridge shooting with a friend, we put up a flock of 40 to 50 several times, and only refrained from shooting in the hope they would stay and breed. On one occasion they passed so close that we could see the dark band across the breast was much darker and broader in some than others. When first seen in the district they looked exactly like Golden Plover. Several were shot in Holbeach Marsh, and one was killed by a telegraph wire on the Bourn and Lynn Railway.

Phasianus colchicus L. **Pheasant.** A regular straggler from the high country preserves, but of late years has taken to regular breeding in the fens. In October 1887 I shot a white cock with red cheeks in Spalding parish.

Perdix cinerea Latham. **Partridge.** Distributed throughout the district, but more plentiful in some portions than others.

Caccabis rufa (L.). **Red-legged Partridge.** Too numerous for sportsmen in the district, where the shooting is almost solely over dogs. It is particularly partial to old straw stacks and pollard stumps for nesting. Many farmers now purposely destroy their eggs.

Coturnix communis Bonnaterre. **Quail.** Only a casual visitor now. Years ago it used to breed almost regularly. I saw one specimen last year. I saw one in newly enclosed marsh in September 1896.

Crex pratensis Bechstein. **Land Rail.** Breeds annually in varying numbers.

Porzana maruetta (Leach). **Spotted Crake.** Occurs almost annually, Cowbit Wash being a favourite haunt. I have also found it in Whaplode and Spalding Marsh. Most probably breeds.

Rallus aquaticus Linnæus. **Water Rail.** Not so uncommon as its skulking habits would lead one to suppose; probably breeds.

Gallinula chloropus (L.). **Moorhen.** Plentiful in all suitable localities; breeds.

Fulica atra L. **Coot.** The same may be said of this as the Moorhen. Sometimes in autumn to be found in large numbers at the mouth of the Welland.

Grus communis Bechstein. **Crane.** Said at one time to have been common. Herons are often called Cranes in this district.

Œdicnemus scolopax (S. G. Gmelin). **Stone-Curlew.** I have only seen one in this district, and that was picked up in an exhausted state, in August 1892, in the parish of Long Sutton; it was a young bird, and from the frayed appearance of the tail and wings appeared to have escaped from confinement.

Eudromias morinellus (L.). **Dotterel.** Only a very casual spring visitor, and not nearly so numerous as in former years.

Ægialitis hiaticola (L.). **Ringed Plover.** Plentiful on the coast, but I have not found it breeding in this district.

Ægialitis curonica (Gmelin). **Little Ringed Plover.** Mr. Browne, of Leicester, informed me that he obtained it in September 1894 in Holbeach Marsh.

Charadrius pluvialis L. **Golden Plover.** Usually very numerous in the winter and taken in great numbers in nets. Two men in one day during last March (1895) took 115, for which they received 1s. 3d. each.

Squatarola helvetica (L.). **Grey Plover.** An annual winter visitor to the coast, varying greatly in numbers in certain

seasons. I shot one in Holbeach Marsh in September, out of a flight of five, in nearly perfect summer plumage, the remaining four in winter plumage.

Vanellus vulgaris Bechstein. **Lapwing.** Very plentiful in autumn and winter; also breeds in small numbers. Some years ago (1887) I found several nests on Cowbit Wash in which the eggs were quite oval instead of pointed, and marked with peculiar streaks and spots of black on a pale stone ground.

Strepsilas interpres (L.). **Turnstone.** Generally plentiful on the coast in the autumn, returning again in the late spring and early summer in smaller numbers. Has quite a peculiar cry. One shot by me in summer plumage is now in the Nat. Hist. Museum, South Kensington.

Hæmatopus ostralegus L. **Oystercatcher.** Until September 1894 I had never come across this bird, but in that month I saw numbers.

Phalaropus fulicarius (L.). **Grey Phalarope.** Occurs frequently. I remember some years ago many of these birds were about, and I heard of several seen on the ponds in the immediate neighbourhood.

Scolopax rusticola L. **Woodcock.** An annual autumnal straggler.

Gallinago major (Gmelin). **Great Snipe.** Seldom seen now. I shot one about three years ago on Cowbit Wash, where years ago it was at least an annual visitor. One was seen on the river Glen in September 1896.

Gallinago cœlestis (Frenzel). **Common Snipe.** Varies in numbers according to the season, but not nearly so numerous as in former years. Breeds annually on Cowbit Wash. In September 1892 I killed three at a shot, and I have before twice killed two. Is particularly numerous this season (1896).

Gallinago gallinula (L.). **Jack Snipe.** The same may be said of this as the former. It was far the most numerous last season (1895).

Tringa alpina L. **Dunlin.** Very numerous during the autumn and winter; a few pairs occasionally remain to breed.

Tringa minuta Leisler. **Little Stint.** Has appeared in fair numbers in Holbeach Marsh of late years during the autumn.

Tringa subarquata (Güldenstädt). **Curlew Sandpiper.** To be found every autumn on the coast with Dunlin, Ring Plover, and Turnstone. Is at once distinguished from the Dunlin by its conspicuous white upper-tail coverts when flying; also it is a trifle larger and slightly lighter in colour.

Tringa striata L. **Purple Sandpiper.** Occurs almost every autumn, and is always unusually tame.

Tringa canutus L. **Knot.** Appears in large numbers during the winter all along the coast. I have also shot it inland in Moulton Marsh.

Calidris arenaria (L.). **Sanderling.** Only visits the coast of this district, so far as I have been able to ascertain, on its summer migration north, at which time I have seen it in beautiful plumage. A specimen shot by me in summer plumage is now in the Natural History Museum, South Kensington. This and another were both shot the same day in June.

Machetes pugnax (L.). **Ruff.** An annual autumn visitor, occasionally in the spring. The excess of Ruffs over Reeves has often occurred to me as peculiar; during the last two years I have seen sixteen Ruffs and only three Reeves. The largest flock I ever saw was about thirty, out of which I obtained a Ruff. I understand there are a fair number about this year (1896). If left undisturbed I am convinced they would take up at least one of their old haunts, namely, Cowbit Wash, where several were caught in the beginning of March this year (1896), showing traces of summer plumage.

Totanus hypoleucos (L.). **Common Sandpiper.** Generally to be found along the river and larger drains in summer and autumn; breeds occasionally.

Totanus ochropus (L.). **Green Sandpiper.** An annual autumn visitor to our rivers, drains, and ponds. Locally called 'Black and White' Snipe.

Totanus calidris (L.). **Redshank.** Numerous in the autumn, and diminished numbers remain the winter. Have found it breeding in fair numbers in Cowbit Wash in wet seasons.

Totanus canescens (Gmelin). **Greenshank.** An annual autumn visitor but in diminishing numbers; has a peculiar note even more 'jerky' than the Redshank. In flight the feet are carried like a heron and show beyond the tail.

Limosa lapponica (L.). **Bar-tailed Godwit.** An annual autumn and spring visitor. For culinary purposes I consider there is no bird superior.

Limosa belgica (Gmelin). **Black-tailed Godwit.** The only example of this bird I have obtained I shot in Holbeach Marsh in 1892. It is in my collection.

Numenius arquata (L.). **Curlew.** Very plentiful in autumn and winter.

Numenius phæopus (L.). **Whimbrel.** Nearly as numerous as the Curlew in autumn, and appearing again in fair numbers in spring.

Hydrochelidon nigra (L.). **Black Tern.** A fairly regular autumn visitor, and in various states of plumage.

Sterna fluviatilis Naumann. **Common Tern.** More abundant some years than others. Is of frequent occurrence in the Holbeach Outmarsh.

Sterna macrura Naumann. **Arctic Tern.** The same remarks apply, but it is of more frequent occurrence.

Sterna minuta L. **Lesser Tern.** An annual autumn visitor to the Wash.

Xema sabinii (J. Sabine). **Sabine's Gull.** My specimen was killed in September 1894, one of two in Holbeach Outmarsh.

Larus minutus Pallas. **Little Gull.** I have frequently seen it in company with the Terns, from which it can be distinguished by the square tail.

Larus ridibundus L. **Brown-headed Gull.** Probably the commonest Gull in the district.

Larus canus L. **Common Gull.** Always plentiful.

Larus argentatus Gmelin. **Herring Gull.** Common throughout the district.

Larus fuscus L. **Lesser Black-backed Gull.** Fairly common. Full plumaged birds uncommon.

Larus marinus L. **Great Black-backed Gull.** As of the former.

Larus glaucus Fabricius. **Glaucous Gull.** An immature example, now in the Peterborough Museum, was shot at Sutton Bridge.

Rissa tridactyla (L.). **Kittiwake.** Plentiful during autumn.

Stercorarius pomatorhinus (Temminck). **Pomatorhine Skua.** Of annual autumn occurrence.

Stercorarius crepidatus (Gmelin). **Arctic Skua.** Of almost regular autumn occurrence, but not so numerous as the former.

Alca torda L. **Razorbill.** Common. Have seen specimens killed in Cowbit Wash.

Uria troile (L.). **Guillemot.** As of the former.

Mergulus alle (L.). **Little Auk.** An almost regular winter visitor. Common some years.

Fratercula arctica (L.). **Puffin.** Also an almost regular winter visitor, but never numerous.

Colymbus glacialis (L.) **Great Northern Diver.** Casual winter visitor.

Colymbus arcticus L. **Black-throated Diver.** As of the former.

Colymbus septentrionalis L. **Red-throated Diver.** Common throughout the Wash, often ascending the river some distance.

Podicipes cristatus (L.). **Great Crested Grebe.** Numerous throughout the Wash in the autumn and winter. I have found it breeding in the neighbourhood of Spalding.

Podicipes griseigena (Boddaert). **Red-necked Grebe.** Occasionally met with in winter.

Podicipes auritus (L.). **Slavonian Grebe.** As of the former.

Podicipes nigricollis (Brehm). **Eared Grebe.** The same remark again applies.

Podicipes fluviatilis (Tunstall). **Little Grebe.** Fairly abundant in suitable places. Breeds.

Procellaria pelagica L. **Storm Petrel.** Taken in Holbeach Outmarsh.

Oceanodroma leucorrhoa (Vieillot). **Leach's Fork-tailed Petrel.** The same remark applies.

Puffinus griseus (O. Reilly). **Great Shearwater.** Taken in Holbeach Outmarsh. My specimen was shot December 1893.

Puffinus anglorum (Temminck). **Manx Shearwater.** Also taken in Holbeach Outmarsh. I shot my specimen in October 1892.

There are several points of interest in connection with Mr. Brogden's notes, such as the occasional capture of a Peregrine in the plover nets, the occurrence of two such varieties in the

Fenland as the Grey-headed Yellow Wagtail, and the Little Ringed Plover, the present position of the Ruff in one of its former chief haunts, Cowbit Wash, the occasional breeding of the Hooded Crow, the Common Sandpiper, and Dunlin in South Lincolnshire, the excess in numbers in the winter on the Wash waters of the Velvet Scoter over the Common Scoter, also in the autumn of the Pomatorhine Skua over the Arctic; in both these cases the very reverse being the case off the Humber and at Flamborough Head.

Some birds, several of them being quite common species, appear to have unaccountably decreased near Spalding, such as the Mistletoe Thrush, the Redbreast, Hedge Sparrow, and Jackdaw. Less remarkable is the decrease of the Quail and Common Pochard. On the other hand, some others, as the Carrion Crow, Goldfinch, Hawfinch, Kingfisher, Turtle-Dove, Red-legged Partridge, and Tufted Duck have increased.—J. C.

NOTES—ORNITHOLOGY.

Great Grey Shrike in Lake Lancashire.—On 26th October 1899 an individual of this (*Lanius excubitor*) was seen (not shot) near Ulverston by two well-known gentlemen, Messrs. M. Cranke and I. Mason. They are both keen sportsmen and not likely, I think, to be mistaken about the bird. The first-named told me he had not seen a specimen in this area for forty years. Macpherson, Fauna of Lakeland, 117, has two records for Rusland Valley, 1887 and 1891; the rest of his chronicles refer to other counties.—S. L. Petty, Ulverston, 2nd November 1899.

Buzzards and Hen Harrier in Northumberland.—Mr. Duncan, naturalist here, is at present preserving two magnificent Buzzards, one a Rough-Legged (*Archibuteo lagopus*) and the other a Common Buzzard (*Buteo buteo*).

Mr. Duncan has records of every Buzzard which has passed through his and his late father's hands during a period extending over sixty years, and this present Rough-legged Buzzard is the only specimen which on dissection has been found to contain a bird. In the others there have been remains of rats, mice, rabbits, frogs, and beetles. This bird had been preying on a grouse.

Mr. Duncan has just finished a Hen Harrier (*Circus cyaneus*), also shot in Northumberland. This, too, had preyed on a grouse.—H. T. Archer, Newcastle-on-Tyne, 16th November 1899.

NOTE—FLOWERING PLANTS.

***Vicia tetrasperma*, etc., in Cheshire.**—Referring to the article on the Flora of Cheshire in the December number of 'The Naturalist,' it may be of interest to record that I came across *Vicia tetrasperma* Mœnch. (*V. gemella* Crantz. of the 9th Edit. Lond. Cat.) at Moreton, in the Wirral Peninsula, in July last. Near the same place, at Leasowe, I found *Lepturus incurvatus* Trin.; and in the spring of last year, also at Moreton, I found *Ranunculus parviflorus* L., a species by no means common in the neighbourhood. As I have not access to Lord De Tabley's 'Flora,' I am not sure whether he has given these localities for these interesting species. —W. Wright Mason, St. Mary's Parsonage, Bootle, 5th December 1899.

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WITH THE ASSISTANCE IN SPECIAL DEPARTMENTS OF

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NOMENCLATURE RULES.—The Nomenclature adopted in 'The Naturalist' will be—as far as possible—in accordance with the latest standard list or monograph, with such alterations as are necessary to bring the name into accordance with the strict law of priority.

CAPITALISATION OF SPECIFIC NAMES.—Hitherto the rule of 'The Naturalist' has been the Zoological one, that specific names shall invariably commence with a small letter, never with capitals. Henceforth, this rule will still apply to all Zoological names, but in deference to the wishes of our botanical contributors the specific names of plants will conform in this respect to the standard catalogue or monograph in each branch of botany.

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Bristol Naturalists' Society.—Exchange List, 5th January 1900. [The Society.
Lincolnshire Notes and Queries, Vol. 6, No. 45, for January 1900. [The Editors.
Yorkshire Archæological Society.—35th Annual Report for 1899. [The Society.
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Philadelphia Acad. of Nat. Sci.—Proceedings, 1899, Part 2, April-Sept. [Academy.
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Revue Bryologique, 27e Anne, 1900, No. 1, 23me Janvier. [M. T. Husnot, Cahan.
Le Mois Scientifique, 2e Année, No. 1, Janvier 1900. [J. B. Baillière & Fils, Paris.
Manchester Geog. Soc.—Journ., Vol. 15, Nos. 7-9, July-Sept. 1899. [The Society.
Manchester Geol. Society.—Trans., Vol. 26, Part 8, 1898-99. [The Society.
Psyche: Journ. of Entom., No. 285, January 1900. [Cambridge Ent. Club, U.S.A.
Naturalists' Journal, Vol. 9, No. 91, for January 1900. [Charles Mosley, Editor.
Science Gossip, N.S., Vol. 6, No. 68, for Jan. 1900. [John T. Carrington, Editor.
Knowledge.—Vol. 23, No. 171, for January 1900. [H. F. Witherby, Ed., London.
La Feuille des Jeunes Naturalistes, No. 351, 1er Janv. 1900. [Mons. Adrien Dollfuss.
The Nautilus, Vol. 13, No. 9, for January 1900. [H. A. Pilsbry, etc., Editors.
Entomologists' Record, Vol. 12, No. 1, 15th January 1900. [J. W. Tutt, Editor.
The Irish Naturalist, Vol. 9, No. 1, for January 1900. [The Editors, Dublin.
The Zoologist, 4th Series, Vol. 4, No. 703, 15th Jan. 1900. [West, Newman & Co., Publ.
Natur und Haus, Jahrgang 8, Hefte 6-7, December 1899. [Gustav Schmidt, Berlin.
Boston Society of Natural History.—Proceedings, Vol. 28, No. 16, April 1899. [Soc.
Nature Notes, Vol. 11, No. 121, for January 1900. [Selborne Society, London.
Hertfordshire Nat. Hist. Soc.—Trans., Vol. 10, Part 1, Nov. 1898. [The Society.
J. W. Fawcett.—Some Timber Trees of Queensland; 8vo. reprint, Nov. 1899. [The Author.
J. W. Fawcett.—The Uses of Forests, 8vo. reprint, June 1899. [From the Author.
Harold Wager.—The Sexuality of the Fungi, 8vo. reprint, Dec. 1899. [The Author.
W. J. Lucas.—Brit. Dragonflies (Odonata).—8vo. cloth, 1900. [L. Upcott Gill, Publ.
Monthly Guide to Periodical Literature, No. 1, Jan. 1900. [Advt. Agency of London.
Edmund Selous.—Tommy Smith's Animals, small 8vo. cloth. [Methuen & Co., Publ.
Sir Edward Fry and Agnes Fry.—The Mycetozoa, sm. 8vo. cloth. [Knowledge Office.
Sir B. W. Richardson.—Biological Experimentation, its Function and Limits, 8vo. cloth, 1896. [The Leighton-Browne Trust.

Wanted to Borrow.—I wish to see the following reports, and should be obliged if any reader would lend them. They shall be returned so soon as possible and carriage paid both ways:—Any Rep. Bot. Ex. Club before 1879, which has been seen; also 1880 and 1881, 1890, 1896-7-8, and Watson Ex. Club Reports 1, 2, 3, 5, 7, 8, 10, 12, 13.—S. L. Petty, Ulverston, Lancs.

BIRDS IN NORTH-WEST LINCOLNSHIRE.

1800 TO 1825.

Rev. EDWARD ADRIAN WOODRUFFE-PEACOCK, L.Th., F.L.S., F.G.S.,
Vicar of Cadney; Organising and Botanical Secretary, Lincolnshire Naturalists' Union.

My grandfather, Edward Shaw Peacock, born 1793, died 1861, of Bottesford Moors, left some MS. notes, of which the following is a copy. He was one of the chief promoters of the warping, by which Bottesford Moors and the surrounding estates in the Trent level were transformed from sandy peat bogs into rich agricultural land. The scientific names and other notes inclosed in brackets are mine, and have been added after consulting the wide experience and knowledge of the late John Cordeaux, M.B.O.U. The original MS. refers only to Nat. Hist. Division 2 :—

Before the lands on the commons (of the Trent level—'the lands' being the various portions enclosed at one time) were warped the following birds were very common :—

Bittern (***Botaurus stellaris*** Linn.) or **Butterbump,** from the noise they made. (He left the stuffed skin of a female bird. The male, shot a few days later, was in the collection of the late Henry Healey, of Ashby Decoy. I have often seen both, but do not know where either are now.)

Glead Hawk (***Milvus ictinus*** Savigny. Common formerly. The last nest I have heard of was taken in Bullington Wood, Nat. Hist. Div. 7, in 1870).

A large **Blue Hawk.** (I have no doubt that the bird referred to was the **Hen-Harrier,** ***Circus cyaneus*** Linn. It nested at Raventhorpe, in the same Div., due east a few miles, as late as 1872. The **Marsh-Harrier,** ***Circus æruginosus*** Linn., I have never found called a Blue Hawk, though we know it was not very uncommon at that date either. It certainly nested in the Isle of Axholme, just over the river Trent, in 1836. Other species locally called by this name are the next in our list; also the **Peregrine Falcon,** for which I have never heard of records on the Trent, though it is not uncommon on the sea coast on migration, and the **Merlin.** The qualifying adjective excludes this species, which nested close by on Manton Common in 1862 and 1875. For the former great abundance of the Hen-Harrier in North Lincolnshire see a letter in 'The Field,' 27th November 1886, by the late Rev. Edward Elmhirst.)

Sparrow Hawk (***Accipiter nisus*** Linn. Still commonly nesting with us).

Ruff and Reeve (***Machetes pugnax*** Linn., now rare in any part of the county).

Redshank (***Totanus calidris*** Linn., nesting with us still).

Snipe (***Gallinago cœlestis*** Frenzel, resident and nesting still).

Jack Snipe (***Gallinago gallinula*** Linn., a winter visitor now).

Teal (***Nettion crecca*** Linn. Nests on Scotton Common, Nat. Hist. Div. 5, a few miles south of Bottesford Moors).

Wigeon (***Marea penelope*** Linn. This bird, if unwounded, leaves Lincolnshire in February and March, but in June 1898 my brother Max and I put a hen bird off her nest on Scotton Common in a tuft of rushes west of the Duck Pond. It contained 11 cream coloured eggs, and was made and lined with most beautiful down, almost as much as I have seen in the case of the Eider Duck. I may also add here that I have met with the **Shoveller,** ***Spatula clypeata*** Linn., locally called the Spoonbill, breeding on Scotton Common too).

Golden Plover (***Charadrius pluvialis*** Linn. Still common in the winter).

Green Plover or **Pyewipe** (***Vanellus vulgaris*** Bech. Common and breeding still).

When Thos. L(ockwood) first began to warp Nathanland (a well-known stretch of the common, which still bears this name though it is all arable fields), he took in or embanked about (blank) acres, across the north end of the 114 belonging to my fa(ther) and Mr. Hall. There was a sandhill in it on which grew great furze or whins (as *Ulex europæus* Linn. is locally called). It was a great place for snakes, as they were safe there (when the other part of the common was flooded, and a great deal of it was under water most of the winter before the enclosure). When the first tide was taken in T(homas) L(ockwood) had several men walking on the top of the banks to be ready to stop it, if any water came through (the recently made embankments). When the water from the Trent had got amongst the furze on the hill the snakes left it and swam to the bank where the men were, who killed them as soon as they got out of the water. Old Thomas Stocks, who was one of the men, told me more than 50 (were killed in this way), and he was always a very punctual (i.e., accurate) man. (The Viper and Common Grass Snake are still found on the commons

close by. I have heard old men speak of 'the wonderful sight' to see 'a flooding' before warping become common. The Fox, Hare, Rabbit, Stoat, and Weasel, as well as the marsh and sand-common birds, all attempted to escape to the banks at once, and became an easy prey to the watchers with guns and sticks. The rabbit has been known to climb to the top of a furze bush to escape a swim and certain death on the bank.) When they took in the middle part of the said land (i.e., Nathan-land) in making an inlet up to the hill Mr. Lan(gton's) house is (now) built on, the men found a raft of trees. (The tree rafts, which were very roughly constructed, were not ancient British, as many people suppose. They were used during the winter floods, up to almost the time of the enclosure, to fetch home the 'reeds and starthack' which had been cut during the previous summer or early autumn and stacked on the sand hills above flood mark to be fetched home when 'the waters were out' for bedding or thatching outhouses. No cart, even in the summer, could be drawn over such treacherous, boggy ground.)

BOOK NOTICE.

The '**Index-Catalogue | of the | Birds | in the | Hancock Collection.** | By **Richard Howse,** M.A. | . . . | . . | . . | — | Sept., 1899,' which runs to 137 pages, is a worthy record of an unrivalled and unique collection, and gives the fullest possible account of every specimen in the series.

NOTE—MOSSES.

New West Lancashire Mosses.—Since the publication of our list of West Lancashire Mosses in the 'Journal of Botany' last year, we have made one or two excursions which have resulted in the discovery of the following species new to the vice-county:—

Sphagnum medium Limpr.
Andreæa Rothii W.&M.
Andreæa crassinervia Bruch.
Brachyodus trichodes Fürnv.
Dicranella rufescens Schpr.
Campylopus atrovirens DeNot.
Grimmia Doniana Sm.
Discelium nudum Brid.
Heterocladium heteropterum B.&S.
Hypnum ochraceum vars. *flaccidum* Milde and *complanatum* Milde.
Hypnum fluitans var. *gracile* Boulay (teste Renauld). New to Britain.
Hypnum fluitans var. *paludosum* Sanio.
Hypnum giganteum Schp.
Hypnum scorpioides L.

There can be little doubt that the extensive fells of the eastern portion of the county and the limestone crags of the northern district will well repay further investigation on the part of bryologists.—J. A. Wheldon and Albert Wilson, Liverpool, 9th January 1900.

REPTILES AND AMPHIBIANS OF THE COUNTY OF DURHAM.

J. W. FAWCETT,

Author of 'The Birds of Durham.'

Owing to every man's hand being against them, reptiles are not very common in the county of Durham, and every year seems to see their number become less. Of those that are generally found, the reptiles are chiefly restricted to the western moors, the lizards to the sandy coast, and the batrachians to larger ponds.

1. ***Vipera berus.*** **Adder, Edder or Ether, Common Viper.** Rare; found chiefly on stony ground and the western moors —Teesdale, Weardale, and Derwentdale.

2. ***Coluber natrix.*** **Common or Ringed Snake.** Much more common than the Viper with which it is often confounded. Found on dry heaths and moors, and places similar to the Viper. Five (two old and three young) were killed in the Browney Valley, near West Butsfield, in August 1883, and one was seen, but not killed, in a field near Satley, in July 1886. One was also seen in the Derwent Valley in the same summer.

3. ***Anguis fragilis.*** **Common Blind-worm or Slow-worm.** Found in damp and unfrequented places, but not common. Has been seen in the Black Banks and Robin's Fancy, in the Browney Valley between Satley and Butsfield.

4. ***Zootoca vivipara.*** **Common Lizard.** An active, harmless, and interesting little creature, common in the quieter parts of the sea-coast and also on the borders of the western moors.

5. ***Rana temporaria.*** **Common Frog.** Common in ponds and stagnant waters.

6. ***Bufo vulgaris.*** **Toad.** Paddick; not so common as the Frog, and becoming scarcer every year. Often met with about ruins and in gardens.

7. ***Triton cristatus.*** **Great Water Newt.** Scarce; in ponds and stagnant water, and damp shady places.

8. ***Lophinus punctatus.*** **Lesser or Common Water Newt.** Commoner than the above, and found in similar situations.

HYMENOPTERA ACULEATA AND TUBULIFERA OF NOTTINGHAMSHIRE.

SECOND LIST.

Rev. A. THORNLEY, M.A., F.L.S., F.E.S.,
South Leverton Vicarage, Lincoln.
AND
J. W. CARR, M.A., F.L.S.,
Professor of Biology in University College, Nottingham.

A Preliminary List of the Aculeate Hymenoptera of Nottinghamshire, by one of us, was published in 'The Naturalist' for January 1898, pp. 13-16; it comprised 63 species, mostly collected at or near South Leverton. The present list comprises 75 additional species, largely obtained in the Nottingham district during the last two summers, but including 13 species contained in an old collection made by the late Mr. Hadfield, of Newark. Many of the specimens in this collection are most interesting, but as this gentleman does not appear to have been in the habit of labelling his captures, there must always be great doubt as to whether any particular example was taken in the county or not. All records obtained from this source are therefore placed within square brackets, and must be looked upon only as indicating that such species may be possible inhabitants of the county. We are not without hope of being able to verify some of these doubtful records in the near future.

The great majority of the species enumerated in the Preliminary List of January 1898 have since been taken in other parts of the county, often commonly, but these are not included in the present paper, which deals only with species not previously recorded. Our county list now comprises 137 Aculeates (about one-third of the British species), of which number 120 have been captured by ourselves. Several of these are of great interest, and have not previously been recorded for any of the Midland Counties.

Six species of *Chrysids* are comprised in the short but interesting list of Tubulifera appended.

We must acknowledge, with gratitude, the kind assistance rendered by the Rev. F. D. Morice, of Woking, in the determination of obscure and difficult species.

1900 February 1.

HYMENOPTERA ACULEATA.

HETEROGYNA.

Formica rufa Linn. The large dome-shaped nests of this species were common about Wigsley and Thorney last summer (J. W. Carr).

Formica fusca Linn. Creswell Crags Quarry, plentiful, 1899 (Thornley and Carr).

FOSSORES.

[***Sapyga clavicornis*** Linn. Four specimens, one ♂ and three ♀s, in the Hadfield collection, may be from the Newark district.]

Salius exaltatus Fab. Langford Moor, near Newark, one ♀, 29th June 1899 (Carr).

Salius pusillus Schiödte. Bulwell Forest, two ♀s, June and July 1899; Thorney, one ♀, August 1899 (Carr).

Salius parvulus Dahlb. Bulwell Forest, seven ♀s, August 1899 (Carr).

Pompilus plumbeus Fab. Treswell Wood, July 1899 (Thornley and Carr).

Pompilus gibbus Fab. Bulwell Forest, one ♀, July 1899 (Carr).

Ammophila sabulosa Linn. Langford Moor, ♂ and ♀ rather common, June and August 1899 (Carr).

Pemphredon lethifer Shuck. Hucknall Torkard, 28th July 1899; Nottingham, 28th July 1898; Thorney, 8th August 1899 (Carr).

Pemphredon shuckardi Moraw. Thorney, 8th August 1899; Hucknall Torkard, 28th July 1899 (Carr).

Mimesa bicolor Jur. Bulwell Forest, very common, burrowing in a bare patch of sandy ground, August 1899 (Carr).

Mimesa equestris Fab. Thorney, one ♀, 5th August 1899 (Carr).

Gorytes mystaceus Linn. Southwell, one ♀, 10th June 1899 (Carr).

Gorytes quadrifasciatus Fab. Thorney, one ♂, 5th August 1899 (Carr).

[***Mellinus arvensis*** Linn. Newark district (?), Hadfield collection.]

Mellinus sabulosus Fab. Rampton, a pair, 18th July 1899, on flowers of *Heracleum sphondylium* (Carr and Thornley). Thorney, one ♀ on flowers of *Angelica sylvestris,* 8th August 1899 (Carr).

Crabro clavipes Linn. South Leverton, one example, 9th July 1898 (Thornley).

Crabro varius Lep. South Leverton; Treswell (Thornley). Bulwell; Nottingham (Carr).

Crabro wesmaeli V.d.Lind. Nottingham, one ♀, 28th July 1898 (Carr).

[***Crabro signatus*** Panz. Newark district (?), Hadfield collection.]

Crabro quadrimaculatus Fab. Langford Moor, near Newark; Sutton, near Retford; 1899 (Carr).

Crabro cribrarius Linn. Very common in the sandy district to the north of Nottingham, as at Bagthorpe, Basford, Bulwell Forest, etc.; also about Harby, Thorney, and Wigsley. Six ♀s captured on Bulwell Forest as they were entering their burrows, were taking home the following species of Diptera with which to provision their nests:—*Calliphora erythrocephala, Hylemyia strigosa*, *Pollenia rudis* (two), and *Thereva nobilitata*? (two) (Carr).

Crabro peltarius Schreb. Langford Moor, near Newark, 29th June 1899, three ♀s; Bulwell Forest, flying commonly about the furze bushes, 8th July 1899 (Carr). Bulwell (B. S. Dodd).

Crabro cephalotes Panz. South Leverton, one ♀, 20th July 1898 (Thornley).

Crabro albilabris Fab. Bulwell Forest, one ♀, 8th July 1899; Thorney, one ♀, 8th August 1899 (Carr).

Oxybelus uniglumis Linn. South Leverton, July 1898 (Thornley). Cottam, July 1899 (Thornley and Carr). Bulwell Forest; Hucknall Torkard; Sutton, near Retford; July 1899 (Carr).

DIPLOPTERA.

Vespa sylvestris Scop. Treswell (Thornley and Carr). Welham (Thornley). West Burton; Broadholme; Barton; Budby, in company with *V. rufa*; Bunny, abundantly with *V. vulgaris* and *V. germanica*; in all these localities the wasps occurred on the flowers of *Scrophularia aquatica* (Carr). Nottingham, in a garden (W. Rigby).

Odynerus spinipes Linn. Treswell Wood, one ♀, July 1897 (Thornley). In this same locality we found the insect in profusion in July 1899, burrowing into the soil among the branches of old upturned tree roots. The beautiful external tubular structures forming the entrances to the burrows were very numerous. The parasites *Chrysis ignita* and *C. viridulus* (*bidentatus*) were not uncommon about the burrows. The burrows were also found in the clay banks of the Lea Beck in the village of Treswell; in and about these we caught *Chrysis viridulus* and *C. neglectus* (Thornley and Carr). South Leverton, one ♂, 11th July 1898 (Thornley). Strelley; Sutton, near Retford (Carr).

Odynerus pictus Curt. South Leverton, one ♂, May 1897; one ♀, July 1897; Treswell Wood, 14th July 1897 (Thornley).

Odynerus parietinus Linn. South Leverton, June and July 1897 (Thornley). Treswell and Treswell Wood (Thornley and Carr).

Odynerus gracilis Brullé. On flowers of *Scrophularia aquatica*, North Wheatley, 13th July 1899 (Carr). Rather common with *Vespa sylvestris* on *Scrophularia* at Treswell, 18th July 1899 (Thornley and Carr).

ANTHOPHILA.

Colletes succincta Linn. Bulwell Forest, two ♀s flying over *Erica cinerea*, August 1899 (Carr).

Colletes daviesana Sm. South Leverton, one ♀, July 1898; Langford Moor, 29th June 1899 (Thornley). Bagthorpe, Nottingham, July 1899, both sexes in profusion burrowing in the sandstone rock at the sides of the road-cutting near the prison; Sutton, near Retford, in gravel pit, 19th July 1899; Bulwell Forest, September 1899. At Bagthorpe and Sutton the parasites *Epeolus productus* and *Chrysis ignita* occurred commonly (Carr).

Sphecodes gibbus Linn. Treswell and Cottam, July 1899 (Thornley and Carr). Basford; Blidworth; Budby; Bunny; Langford Moor; July and August 1899 (Carr).

Sphecodes subquadratus Sm. Cottam, about burrows of *Halictus rubicundus*, July 1899 (Thornley and Carr). Arnold; Bagthorpe; Blidworth; Budby; Bulwell Forest; Langford Moor, Newark; Treswell Wood; June to August 1899 (Carr).

Sphecodes similis Wesm. South Leverton, one ♀, 1897 (Thornley).

Sphecodes variegatus v.Hag. Blidworth, one ♂, 22nd August 1899 (Carr).

Sphecodes affinis v.Hag. Blidworth; Sutton, near Retford; Thorney; July and August 1899 (Carr).

Halictus quadrinotatus Kirb. Thorney, three ♂s, 8th August 1899; Langford, ♂s common on flowers of *Tanacetum vulgare*, 12th August 1899 (Carr).

Halictus albipes Kirby. Arnold; Bulwell; Bunny; June to September 1899 (Carr).

Halictus villosulus Kirby. Treswell, July 1899 (Carr). Cottam (Thornley and Carr).

Halictus nitidiusculus Kirby. Arnold; Bagthorpe; Basford; Bulwell; Burton Joyce; Gedling; Hucknall Torkard; 1899 (Carr).

Halictus tumulorum Linn. Bulwell Forest, 3rd June to September 1899; Blidworth, July 1899 (Carr). Sturton, July 1899 (Thornley).

[***Halictus morio*** Fab. Newark district (?), one ♂, Hadfield collection.]

Halictus leucopus Kirby. Gedling, ♀, 23rd April 1899; Thorney, ♀, 8th August 1899; Arnold; Blidworth; Bulwell; Hucknall Torkard; August 1899, a ♂ in each locality (Carr).

[***Halictus leucozonius*** Schr. Newark district (?), Hadfield collection.]

Halictus punctatissimus Shuck. Blidworth, one ♂, 22nd August 1899 (Carr).

Halictus atricornis Sm. Sherwood Forest, near Edwinstowe, two ♂s, 30th July 1899 (Carr).

Halictus minutus Kirby. Bunny, one ♂, 23rd August 1899 (Carr).

Andrena cineraria Linn. Babworth, 1898 (S. Pegler). Langford Moor, Newark, 29th June 1899 (Carr).

Andrena nigro-ænea Kirby. Burton Joyce; Gedling; Keyworth; Southwell; Strelley; April to June 1898-9 (Carr). Walkeringham (Thornley).

Andrena gwynana Kirby. South Leverton, April 1899 (Thornley). Gedling; Staunton; Linby; April and May 1899 (Carr). Sutton, near Retford, two ♀s, 19th July 1899 (Carr).

[***Andrena varians*** Rossi. Newark district (?), Hadfield collection.]

[***Andrena thoracica*** Fab. Newark district (?), Hadfield collection.]

Andrena fucata Sm. Southwell, one ♂, 10th June 1899; Strelley, nine ♂s, 14th June 1899 (Carr).

Andrena denticulata Kirb. Sherwood Forest, near Edwinstowe, 30th July 1899; Wigsley and Thorney, 7th and 8th August 1899 (Carr).

[***Andrena fulvicrus*** Kirby. Newark District (?), Hadfield collection.]

Andrena albicrus Kirb. Treswell Wood, one ♀ (Thornley). Bulwell Forest, three ♂s and sixteen ♀s, June and July 1899; Langford Moor, one ♀, worn, 12th August 1899 (Carr).

Andrena analis Panz. Langford Moor, Newark, ♂s, 29th June 1899 (Thornley and Carr).

Andrena coitana Kirby. Thorney, one ♀, 8th August 1899 (Carr).

Andrena humilis Imhoff. Bulwell Forest, both sexes commonly, 11th June 1899 (Carr).

Andrena minutula Kirby. Widmerpool, one ♂, 13th May 1899 (Carr).

[***Andrena similis*** Sm. Newark district (?), Hadfield collection.]

[***Andrena tibialis*** Kirby. Newark district (?), Hadfield collection.]

[***Andrena bimaculata*** Kirby. Newark district (?), Hadfield collection.]

[***Andrena afzeliella*** Kirby, race ***intermedia*** Thoms. Newark district (?), Hadfield collection.]

Nomada succincta Panz. Widmerpool, 13th May 1899; Burton Joyce, 27th May 1899; Staunton, 6th May 1899 (Carr).

Nomada fabriciana Linn. Widmerpool, 13th May; Strelley, 12th June 1899 (Carr).

Nomada flavoguttata Kirby. Strelley, one ♂, 14th June 1899 (Carr). Treswell Wood, one example, 10th July 1899 (Thornley).

Nomada solidaginis Panz. Wigsley, one ♂, 7th August; Thorney, one ♂, 8th August; Langford Moor, one ♀, 12th August 1899 (Carr).

Cœlioxys elongata Lep. (= ***simplex*** Nyl.). Langford Moor, Newark, 29th June; Bulwell Forest, two ♀ s on flowers of *Rubus,* 8th July 1899 (Carr).

Epeolus productus Thoms. Sutton, near Retford, seven ♀ s, 19th July; Bagthorpe, Nottingham, eight ♀ s, July and August; Langford Moor, one ♀, 12th August 1899 (Carr).

Epeolus rufipes Thoms. Blidworth, one ♀, 22nd August 1899 (Carr).

[***Megachile willughbiella*** Kirb. Newark district (?), Hadfield collection.]

[***Osmia fulviventris*** Panz. Newark district (?), Hadfield collection.]

[***Osmia aurulenta*** Panz. Newark district (?), Hadfield collection.]

Bombus hortorum Linn. var. ***harrisellus*** Kirby. River bank, North Leverton, 14th July 1899; Treswell, July 1899 (Thornley and Carr). Bulwell, 9th August 1899 (Carr).

HYMENOPTERA TUBULIFERA.

Elampus auratus Linn. South Leverton (Thornley). Treswell Wood (Thornley and Carr).

Chrysis cyanea Linn. Thorney, 8th August 1899 (Carr).

Chrysis ignita Linn. South Leverton; Treswell; Retford (Thornley). Nottingham; Bagthorpe; Hucknall Torkard; Sutton, near Retford (Carr).

Chrysis ruddii Shuck. South Leverton, one ♂, June 1896 (Thornley).

Chrysis viridula Linn. (= ***bidentata*** L.). Treswell and Treswell Wood, about the burrows of *Odynerus spinipes,* July 1899 (Thornley and Carr).

Chrysis neglecta Shuck. Treswell, about the nests of *Odynerus spinipes,* July 1899 (Thornley and Carr).

SOME INSECTS AND SPIDERS FROM INGOLDMELLS, LINCOLNSHIRE.

Rev. EDWARD ADRIAN WOODRUFFE-PEACOCK, L.Th., F.L.S., F.G.S.,
Vicar of Cadney; Organising and Botanical Secretary, Lincolnshire Naturalists' Union.

The following is a report on some insects from Ingoldmells, Nat. Hist. Div. 11, taken by myself on the 19th to 21st August and on the 21st September 1899.

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The Rev. Alfred Thornley, M.A., F.L.S., examined the insects submitted to him. Being away from home at the time, and having only a small quantity of apparatus with him, he had to leave over for further inspection some three or four small beetles and flies.

COLEOPTERA.

Lagria hirta. Several.
Adalia bipunctata.
Coccinella 10-punctata.
Crepidodera ferruginea.
Dromius linearis.
Demetrias atricapillus.
Rhizobius litura.
Coccidula rufa.
Enicmus minutus.
Melanophthalma gibbosa.
Calathus mollis. Seven.
Nebria brevicollis. One ♀.
Calathus flavipes. One.
Pogonus chalceus. Two.
Trechus minutus. One.
Tachyporus hypnorum. One.
Proteinus ovalis. One.
Anobium domesticum.
Bembidium varium. Several.
Athöus longicollis. One ♂.
Catops sericea.
Phytobius notula. One.
Stilbus consimilis.
Adrastus limbatus. Two.
Ægialia arenaria.
Apion dichröum.
Oxytelus sculpturatus.
Coccinella 11-punctata.
Stilbus consimilis. Two.
Aphodius contaminatus. One.
Sitones lineatus. One.
Cleonus sulcirostris. One.
Otiorrhynchis ovatus. One.

All of which species are more or less common in the Midlands with the exception of *Phytobius notula*, which is uncommon, and *Adrastus limbatus*, which is common in the south of England.

ORTHOPTERA.

Several immature examples of a Stenobothrus, which he believes is 'elegans.'

HEMIPTERA.

Rhopalotomus ater.
Nabis flavomarginatus. Two.
Philænus spumarius.
Doratura stylata (Boh.). One ♀.
Megalocærea erratica. ♂ and ♀.

DIPTERA.

Examples of three species of Oxycera (Stratiomyidæ) to be determined later.
Eristalis pertinax. Two ♀s.
Syrphus balteatus. One ♂.

HYMENOPTERA.

Bombus hortorum. One ♀.
Bombus agrorum. One ♂.
Vespa germanica. One ☿.

The Spiders I found have been verified by Rev. O. Pickard-Cambridge, as follows :—

Philodromus fallax Lund.
Trochosa picta Hahn.
Trochosa terricola Thor.
Stemonyphantes lineatus Linn.
Pachygnatha degeerii Sund.
Gongylidium dentatum Wid.

HARVEST MEN.

Phalangium cornutum Linn.
Phalangium saxatile C. L. Koch.

MOSSES NEW TO NORTH OR TO SOUTH LINCOLNSHIRE.

Miss S. C. STOW,
Court Leys, Brandon, Grantham.

The following is a list of the Mosses which have been discovered in the County of Lincoln since Mr. J. Larder's paper was published in 'The Naturalist' in February 1898, pp. 53-60. It contains 61 species, 13 new to N. Lincs. 54, and 51 new to S. Lincs. 53. Three are new to the county as a whole.

I have to thank the following gentlemen for help in collecting and naming:—The Revs. W. Fowler, S. Gasking, W. W. Mason, and A. Thornley, and Messrs. H. Fisher, H. Preston, and M. Peacock. Other ladies and gentlemen have helped in collecting, but have not been lucky enough to discover new species within our borders.

The Rev. E. Adrian Woodruffe-Peacock, who carried on our Moss Register, after the publication of Mr. J. Larder's list until it was handed over to me, desires me to thank Mr. L. J. Cocks for much obliging and invaluable assistance given in verifying species.

Pogonatum aloides Hedw. S. Div. 13. Stapleford Moor, 1898, S. C. Stow.

Polytrichum piliferum Schreb. S. Div. 13. Stapleford Wood, 1899, S. C. Stow.

Polytrichum gracile Dicks. N. Div. 1. Haxey, 1898, Rev. W. Fowler. S. Div. 13. Stapleford Moor, 1898, S. C. Stow. S. Div. 15. Stubton, 1898, S. C. Stow.

Polytrichum commune L. var. ***perigoniale*** B.&S. N. Div. 1. Haxey, 1899, Rev. W. Fowler.

Pleuridium alternifolium Rab. N. Div. 10. Woodhall Spa, 1899, S. C. Stow. S. Div. 13. Court Leys, 1899, S. C. Stow. S. Div. 15. Brandon, 1899, S. C. Stow.

Ditrichum flexicaule Hpe. S. Div. 14. Cranwell, 1899, S. C. Stow.

Campylopus flexuosus Brid. S. Div. 13. Stapleford Wood, 1899, S. C. Stow.

Fissidens exilis Hedw. S. Div. 13. Court Leys, 1899, S. C. Stow.

Fissidens bryoides Hedw. S. Div. 15. Harrowby, 1898, H. Fisher; and Brandon, 1898, S. C. Stow. S. Div. 13.

Court Leys, 1898, and Fulbeck, 1898, both S. C. Stow. S. Div. 14. Cranwell, 1898, S. C. Stow.

Fissidens decipiens DeNot. S. Div. 15. West Willoughby Quarry, 1898, S. C. Stow.

Pottia recta Mitt. S. Div. 13. Washingborough, 1898, Rev. W. W. Mason.

Pottia bryoides Mitt. S. Div. 13. Caythorpe, 1899, S. C. Stow.

Pottia truncata L. S. Div. 13. Court Leys, 1898, Fulbeck, 1898, and Fenton, 1899, all S. C. Stow. S. Div. 15, Brandon, 1898, S. C. Stow.

Pottia minutula Fürner. S. Div. 13. Caythorpe, 1899, S. C. Stow.

Pottia lanceolata C.M. S. Div. 13. Caythorpe, 1899, S. C. Stow.

Tortula lamellata Ldb. S. Div. 13. Caythorpe, 1899, S. C. Stow. S. Div. 14. Cranwell, 1899, S. C. Stow. S. Div. 15. Sapperton, 1899, S. C. Stow.

Tortula aloides DeNot. S. Div. 13. Caythorpe, 1899, S. C. Stow. S. Div. 14. Cranwell, 1898, S. C. Stow.

Tortula subulata Hedw. S. Div. 13. Court Leys, 1898, and Fulbeck, 1898, both S. C. Stow.

Tortula mutica Ldb. S. Div. 13. Court Leys, 1898, and Fulbeck, 1898, both S. C. Stow.

Tortula papillosa Wils. N. Div. 10. Woodhall Spa, 1899, S. C. Stow. S. Div. 13. Court Leys, 1898, S. C. Stow. S. Div. 15. Brandon, 1899, S. C. Stow.

Barbula lurida Ldb. S. Div. 15. Little Ponton, 1898, H. Preston.

Barbula rubella Mitt. S. Div. 14. Cranwell, 1899, S. C. Stow. S. Div. 15. Great Ponton, 1898, H. Preston.

Weisia crispa Mitt. S. Div. 13. Court Leys, 1899, S. C. Stow.

Encalypta vulgaris Hedw. S. Div. 14. Cranwell, 1898, S. C. Stow.

Zygodon viridissimus R.Br. S. Div. 13. Court Leys, 1899, S. C. Stow. S. Div. 14. Cranwell, 1899, S. C. Stow.

Orthotrichum anomalum Hedw. S. Div. 13. Washingborough, 1898, Rev. W. W. Mason. S. Div. 15. Great Ponton, 1898, H. Fisher.

Orthotrichum anomalum var. ***saxatile*** Milde. S. Div. 13. Caythorpe, 1899, S. C. Stow. S. Div. 14. Cranwell, 1899, S. C. Stow. S. Div. 15. Great Ponton, 1898, H. Preston.

Orthotrichum diaphanum Schrad. S. Div. 13. Court Leys, 1898, Fulbeck, 1898, and Stapleford Wood, 1899, all S. C. Stow. S. Div. 14. Cranwell, 1898, S. C. Stow. S. Div. 15. Brandon, 1898, S. C. Stow.

Orthotrichum Lyelli H.&T. S. Div. 13. Caythorpe, 1898, S. C. Stow.

Tetraplodon mnioides B.&S. N. Div. 5. Scotton Common, 1898, Revs. A. Thornley and E. A. W.-Peacock.

Physcomitrium pyriforme Brid. S. Div. 13. Court Leys, 1898, S. C. Stow. S. Div. 15. Somerby Marsh, 1898, H. Fisher; and Brandon, 1898, S. C. Stow.

Aulacomnium palustre Schwgr. S. Div. 13. Stapleford Wood, 1899, S. C. Stow.

Aulacomnium androgynum Schwgr. S. Div. 13. Stapleford Wood, 1898, and Court Leys, 1898, both S. C. Stow.

Webera albicans Schp. S. Div. 15. Brandon, 1898, S. C. Stow.

Bryum lacustre Brid. N. Div. 9. North Somercotes, 1899, Rev. W. W. Mason.

Bryum uliginosum B.&S. S. Div. 14. Cranwell, 1898, S. C. Stow.

Bryum intermedium Brid. S. Div. 13. Court Leys, 1898, S. C. Stow.

Bryum capillare L. var. ***rosulatum*** Mitt. N. Div. 3. Cadney, 1898, Revs. S. Gasking and W. W. Mason.

Bryum Donianum Grev. S. Div. 13. Court Leys, 1898, S. C. Stow.

Mnium punctatum L. S. Div. 14. Cranwell, 1898, S. C. Stow.

Homalia trichomanoides Brid. S. Div. 13. Court Leys, 1898, S. C. Stow. S. Div. 15. Stoke Rochford, 1898, Rev. W. W. Mason.

Thamnium alopecurum L. S. Div. 13. Court Leys, 1899, S. C. Stow. S. Div. 14. Cranwell, 1898, S. C. Stow. S. Div. 15. Sapperton, 1899, S. C. Stow.

Leskea polycarpa Ehrh. S. Div. 13. Court Leys, 1898, and Fulbeck, 1898, both S. C. Stow.

Brachythecium albicans B.&S. S. Div. 13. Court Leys, 1898, S. C. Stow. S. Div. 15. Sapperton, 1899, S. C. Stow.

Brachythecium rutabulum B.&S. var. ***longisetum.*** N. Div. 5. Scotton Common, 1898, P. and P.

Brachythecium populeum B.&S. S. Div. 15. Great Ponton, 1898, H. Preston.

Brachythecium plumosum B.&S. S. Div. 14. Cranwell, 1898, S. C. Stow.

Eurhynchium piliferum B.&S. N. Div. 3. Housham Barf Wood, 1898, P. and P. N. Div. 6. Sturton-by-Stow, 1898, R. J. Owston.

Rhyncostegium murale Hedw. S. Div. 13. Court Leys, 1898, S. C. Stow. S. Div. 14. Cranwell, 1898, S. C. Stow. S. Div. 15. Hough, 1898, and Ancaster, 1898, both S. C. Stow.

Plagiothecium undulatum B.&S. S. Div. 13. Stapleford Wood, 1899, S. C. Stow.

Amblystegium irrigium B.&S. N. Div. 3. Cadney, 1898, Revs. W. W. Mason and S. Gasking.

Hypnum stellatum Schreb. var. ***protensum*** B.&S. S. Div. 15. West Willoughby Quarry, 1898, S. C. Stow.

Hypnum chrysophyllum Brid. S. Div. 15. Ancaster, 1898, and West Willoughby Quarry, 1898, both S. C. Stow.

Hypnum Kneiffii Bry.Eur. S. Div. 13. Stapleford Moor, 1898, S. C. Stow.

Hypnum Wilsoni Schp. N. Div. 9. North Somercotes, 1899, Rev. W. W. Mason.

Hypnum commutatum Hedw. S. Div. 15. Stoke Rochford, 1898, Rev. W. W. Mason; and Grantham, 1898, H. Preston.

Hypnum falcatum Brid. N. Div. 9. North Somercotes, 1899, Rev. W. W. Mason.

Hypnum cupressiforme L. var. ***minus*** Wils. S. Div. 13. Court Leys, 1898, S. C. Stow.

Hypnum palustre L. S. Div. 15. Great Ponton, 1898, H. Preston.

Hypnum stramineum Dicks. N. Div. 5. Scotton Common, 1898, P. and P.

Hylocomium loreum B.&S. S. Div. 13. Court Leys, 1898, S. C. Stow.

BRITISH DRAGONFLIES.

British Dragonflies | (*Odonata*). | — | By | **W. J. Lucas,** B.A., F.E.S. | (Author of "British Hawk Moths," "British Butterflies," &c.). | — | Illustrated with Coloured Plates and Black- | and-White Drawings. | — | London: | L. Upcott Gill, 170, Strand, W.C. | — | 1900. [Demy 8vo. cloth, pp. xvi. + 356 + four of advertisements + 27 coloured plates, price 31s. 6d.].

This book, which for many months has been awaited with considerable interest, has at length appeared, and fully justifies the expectations which had been formed of it. It is just what has been wanted for a long time, and can scarcely fail to accelerate the study of this order of insects. Extending to 356 pages, the first 62 are comprised of five chapters, including the Introduction. Chapter II. treats of the 'Life History' in a clear and interesting style; Chapter III. is devoted to 'Classification,' and Chapters IV. and V. to the 'Nymph' and 'Imago' respectively. To the student these two chapters will probably be the most useful of this part of the book, and, indeed, too much praise can scarcely be given for the exhaustive and careful way in which especially the details of structure and the analytical tables have been worked out, whilst the numerous accompanying diagrams have been well chosen to clearly explain the text. Chapter VI., 'Genera and Species,' gives practically a separate history of each of the British species, and thus naturally forms the chief and by far the greatest portion of the book. Under each species are given the synonymy; the original description; full description of both sexes of the imago, and when known also of the egg and nymph; date of appearance; habits; distribution. Under this last heading nearly all the known localities (when properly authenticated) seem to be recorded, including those in our own county of Yorkshire, though a number of fresh ones can, to our own knowledge, already be added to them. Perhaps nothing in the book shows more clearly what there still remains to be done among the Dragonflies than these paragraphs on distribution. The localities given being so few, imply that but an insignificant portion of the area of Britain has ever known the neuropterist's net, a condition of things which it is to be hoped the advent of this book will speedily change. And, under such circumstances, we scarcely yet feel disposed to subscribe to the sentiment expressed in the last sentence of the Introduction, 'Whether others (species) remain to be discovered in the British Isles cannot of course be said, but the likelihood does not seem great, and it must be confessed that in all probability future changes in the total number of

British Dragonflies must be looked for in the way of decrease only.' In Chapter VII. is given the evidence on which the seven reputed British species were at one time included in our list. Chapter VIII. is devoted to 'Breeding the Nymph,' and Chapter IX. to 'Preparing for the Cabinet,' a most useful and fitting ending of the work.

The book is beautifully illustrated with coloured plates of all the acknowledged British species, and the plates generally are distinctly good, the only one to which serious exception can be taken being XXIV., though in the figures of *Æschna cyanea* on Plate XVII. the large yellow spots on the thorax should be oval, and not oblong-square as depicted: this is important, as the shape of these marks forms one of the best guides in distinguishing the species from *Æ. juncea*. All the larger species are given 'life size,' the smaller species, i.e., from the genus *Lestes* onwards, double the natural size. We are not sure it would not have been better to have depicted all in the natural size, with, when necessary, magnified sections showing characteristic markings of segments. This *is* done with abdominal segments 1 and 2 in all the species in the genus *Agrion*, in order to show the different forms of the U-mark on the second segment, and which is so valuable a factor in the determination of the males of the various species in this genus.

The book is well got up, clearly arranged and printed, and the paper, both of the text and plates, excellent. It will fill a gap which has long been waiting for it, though if the study of the *Odonata* is pursued with the same ardour as during even the past few years, we think another edition will be necessary at no distant date. G. T. P.

NOTE—FLOWERING PLANTS.

***Taraxacum* forms at Markland Grips, Derbyshire.**—In the course of an afternoon's ramble at Markland Grips, N.E. Derbyshire, on 3rd June 1899, I met with no less than four of the five named forms of the common Dandelion, viz.: (1) the ubiquitous *Taraxacum Dens-leonis* Desf., in the rich pasture land; (2) *T. corniculatum* DC. (= *T. erythrospermum* Andrz. of Lond. Cat., 9th ed.), abundant in the chinks of the limestone rocks; (3) *T. palustre* DC., common in the marshy spots; and (4) *T. lævigatum* DC., a few plants only, on a dry grassy bank at the top of the valley. This last form, I understand from the Rev. W. R. Linton, has not previously been recorded from Derbyshire, so at his suggestion I forwarded the specimens to Mr. Frederick Townsend, and that gentleman has confirmed their identification. Another interesting find on the same occasion was a form or state of the common Daisy (*Bellis perennis* L.), without rayflorets. Several plants of this curious-looking form were growing together in a damp shady spot.—Thos. Gibbs, Sheffield, 6th January 1900.

AN OLD LEEDS HERBARY.

F. ARNOLD LEES, M.R.C.S.,
Roundhay, Leeds; Author of the Flora of West Yorkshire.

THE tongueless messages of an old Hortus Siccus are not without their value apart from the pathos embalmed in their mummified presentments. A lustrum ago I acquired, through the generosity of Mr. Hy. Walker, bookseller, a bulky fasciculus of Dried Plants which had been brought together by the late Dr. J. Deakin Heaton, a resident in Leeds—to judge by the dates attached to the specimens—from 1835 to his death in 1880. Probably my particular accretion did not include everything of note communicated to or found by the doctor: species used to be deposited in the Museum of the Medical School but, going through what I acquired, recently with some thoroughness, I was surprised to find the localities whence several of the items were drawn to be both significant and unpublished. The whole of them make up a picture of the past which emphasises the great change in the character of the suburban flora that has gone on. As examples: fifty years ago the Bee Orchis, and the Fly, grew at Scarcroft, the lesser Pyrola on Whinmoor, the Water Violet at Swillington, and by the 'beck' (now a covered-in goit) at Sheepscar grew both the Comfrey and the purple Loosestrife. All these and more are now of a surety relegated for ever to farther fields.

Ancillary to a brief glance at a dead-and-gone generation, too, is a wish to once again adumbrate a theory, deduced from experience, of that change and compensation which, in matters botanical, hold everywhere outside the very pavements of a large town. As some species die out naturally, others—as naturally—take their forerunners' place. Great alterations, from green meads to brick-and-mortar dwelling-houses have, of course, affected the periphery of our borough area; but more than this, the surface uninterfered with by Man has changed, and with it has changed the flora it gave rise to. Knostrop, Whinmoor, Moortown, and Allwoodly are not built over, yet no more offer they a home to Cotton-grass by the acre, or heath and furze by the square mile. Adel dam and numerous smaller sheets of water are almost no-more; filled up with the land-making Reed-mace that, its work done, is ousted from existence by Tussock Sedge, Juncaceæ and aquatic Sallows. The *Lysimachia vulgaris* that in 1840 fringed the Foundry ponds at low Osmondthorpe,

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where too (as at Adel) Osmunda used to grow, has gone for ever unless its descendants, transplanted from the wild for their golden wealth of blossom—not an impossible supposition—are among those which, undaunted by grime, still grin gayly through the garden railings of Mount Preston and other of the older residential parts of the city. Within the writer's memory the bonny Bog-bean, the *Vaccinium Vitis-Idæa*, the lovely *Anagallis tenella,* and the singular, mud-loving *Limosella* have all disappeared from the 'Seven Arches' vicinage, the *Lycopodium clavatum* from Scotland Mills; and latest of all, and very reluctantly (to all appearance, for they are of the hardiest in constitution) the Woodruffe and Tuberous Vetchling are no longer to be found in or near Batty Wood, with the *Galium verum* that, writing in 1872 in the Journal of Botany, I truthfully described as making gay bank and bridlepath by the old windmill on Sugar-hills, out by Potternewton. These be trivial matters, but like the proverbial straw they show which way the wind blows: extinction and substitution is the Order in all Life.

A word of explanation why the Heatonian records which follow were not included in the Flora of West Yorkshire may be permitted. As the Dean of the Medical School and keeper of its herbarium, sometime later in the charge of Mr. Frederick Greenwood and Mr. Edward Atkinson, all themselves botanists, I knew Dr. Heaton's penchant well enough, and looked through the school herbary more than once; but, at this time, in the middle Sixties, I was a learner merely myself, and for a 'Flora' of Leeds 'sometime' it was to Professor Miall that eyes were turned. In the late Eighties when it finally took shape under my hand, I was concerned more with the Riding as a whole, and with what still survived within its marches, than with pictures however significant of the rococo in Things Botanical. I never even thought of asking for leave to inspect the Dean's private collection at Claremont.

Dr. Heaton died in 1880; and the Memoir of his life somewhat largely built on his diaries, published three years afterwards, is most inadequate so far as showing in its due proportions the botanical side of his character and attainments. As was, perhaps and alas! to be expected of slap-dash Journalism, the doctor's unassuming modesty with regard to his labours among mere vegetables, was not seen, from some lack of sympathy or vision, to be more than the subsidiary pass-time it seemed on the surface.

It is difficult for the writer who handles the seething cauldron of Day-by-day Questions, to see the potentialities in those least-explored byways of Science—*fallentis semita vitæ*—preferred by the shyer followers of Flora; the retiring unostentatious nature of Dr. Heaton's Botanical work does not appear at any rate to have appealed to the memoirist very forcibly.

I will now enumerate direct from the Doctor's dated and labelled sheets the more important of these Extinctions, fully believing in the reliability of the specimens as local witnesses of a real, if antiquarian, interest. 'Ichabod' is the epitaph that fitly serves for them all. None of the localities have been in print before, while one (if not more) of the items is actually an Addition to my published Flora, come to life with a posthumous immortality that to an enthusiast is pathetic and pityful.

The numerals and the species-names agree with those of the Ninth Edn. of the London Catalogue.

25. ***Ranunculus sceleratus.*** **Blisterwort.** Ditch bank by 'Salutation Well' (above Cross-roads, Stonegate, Meanwood), 1859. I recollect this growing there up to about 1863. A great change in the direction of a gradual increase in dryness of the soil all about '*Carr* Manor,' though never a 'carr' in my time, has taken place hereabout.

30. ***Ranunculus Lingua.*** Addle dam, 1846, J. D. H. This loc. appeared in Miall's W. R. Flora of 1862, on the authority of a Mr. A. Shipley.

46. ***Aquilegia vulgaris.*** Addle, streamside, 1846. This was there up to '68 or '69, according to my own earliest notes; it had pale pink blossoms, and the soil being damp sandy peat, with no calcareous strata higher up the beck, which ran from Adel dam, I always held it an established stray from the Corn-mill or cottage gardens a mile higher up.

52. ***Epimedium alpinum.*** **'Barrenwort.** Plantation at Meer's brook, near Sheffield, May 1865,' in Dr. Heaton's writing. Two specimens of a Swiss indigene which has found a place in British Floras for a hundred years, and which, being hardy and able to grow in bare earth in the shade of trees, has established itself where introduced (possibly with soil about the roots of trees) in several counties. This is the first evidence for Yorkshire, however, and it would be interesting to learn if it still grows near Tinsley, where the Deakins—Dr. Heaton's mother's maiden name was Deakin—were farmers. At Meanwood it has grown in certain gardens, like those of the Elsworth's

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and Oates's, for many, many years to my knowledge—one of these private grounds being the site of the fine old *Clematis* clump (equally alien) which overhangs the lane leading from the school to the wood. An old village dame many years ago gravely informed me that the name by which the Barrenwort was known was 'The Happy Medium'! 'because, you see,' said she, 'its flower is neither big nor little, but just the right size,' or some fanciful words to that effect.

55. ***Castalia speciosa*** Salisb. **White Water-lily.** Leeds Botanical Gardens, 1864. Of course introduced there, and I never heard of it growing anywhere native nearer Leeds than Bramham; but the fact of Dr. Heaton deeming it worth while to dry a specimen from ornamental waters is presumptive evidence that it did not grow in the river Aire (!) or elsewhere.

56. ***Papaver somniferum.*** **Opium Poppy.** 'Corn-field near Burley; ex herb. J. D. Heaton.' No date.

[57. *Glaucium luteum.* Bardsea. Miss Forrest. Label in lady's hand. Of course this was *not* the hamlet where Congreve was born, but that on the Lonsdale shore of Morecambe Bay.]

65. ***Chelidonium majus.*** **Swallow-wort.** Specimens, but no locality given. It springs up here and there still, however, on banks, especially where there has been recent disturbance of the soil. This has hitherto been reckoned the subspontaneous result of horticulture, but on no convincing evidence—the occasional sufferance of it in cottage garths, for use as an unguent in Tetter, not being sufficient. It might have been brought from the wilds. Moreover the vicinity of villages, their gardens, etc., are just the places where revision of boundaries and turning up of long-undisturbed earth are constantly taking place; whilst now, I see from Prof. Clement Reid's new work on 'The Origin of the British Flora' (1899, Dulau & Co.) that *Chelidonium* seeds, as well as those of two other waste-bank species in similar case, viz., *Fedia olitoria*, the Lamb's Lettuce (not a bad salad and once grown as such) and *Galeopsis Tetrahit*, the common Hemp Nettle, have been found in the inter-glacial, late-glacial, and neolithic Deposits. As another proof of my Theory of Change and Substitution, I may here say—from the same illuminating book—that the seeds of four other not-now-existing species, an Acer, Trapa, the Polar Willow, the Spruce Fir; with two forms of *Naias,* one the *graminea* said to have got from Egypt into the warm reservoirs of the Manchester cotton-mill area, added by Mr. Charles Bailey to the British Flora a few years back; have every one of them been identified

as occurring in the geo-deposits of days when the conditions were very different from those of historic times. Last link in the argument, we know how wondrous is the viability in seeds whose envelopes are impermeable to the rot of moisture.

83. ***Nasturtium amphibium.*** Knostrop, 1856, J. D. H.

96. ***Cardamine amara.*** Eccup.

185. ***Polygala vulgaris.*** Scarcroft. Fine, a foot in height: I recollect seeing this up to 1870 by field borders (on sand rock) thereabout, lilac and pink and white. It was not *serpyllifolia.*

218. ***Lychnis Githago.*** Cornfields, Burley. A decreasing colonist in Yorks, probably from cleaner seed-corn being used now than formerly.

266. ***Claytonia perfoliata.*** A weed among Rhododendrons, Moortown, 1856. Long gone, I fear.

283. ***Hypericum montanum.*** Scarcroft.

295. ***Tilia grandifolia?*** (Yes.) Henconner Lane, Potternewton, 1856, J. D. H. Planted of course, but the date fixes the planting of these surburban demesnes with trees at about 70 to 80 years ago. This year I noticed a small tree of *Tilia argentea* in Potternewton Lane going towards the Windmill.

323. ***Impatiens Noli-me-tangere.*** A specimen, but not localised.

333. ***Genista anglica.*** Petty Whin. Addle Moor.

337. ***Ulex Gallii.*** Same station, 1848. ? Both there still.

340. ***Ononis arvensis.*** Fields, Addle, 1856. Grew up to 1876 on bank of Otley highroad (new) a little on the Leeds side of where the road crosses the former site of the dam's north-west prolongation—the place where the Swan used to breed regularly.

378. ***Anthyllis vulneraria.*** Collingham.

385. ***Astragalus hypoglottis.*** Collingham, 1868.

386. ***Astragalus glycyphyllus.*** Kippax. This and the two previous species are not yet extinct, being away from urban alteration.

389. ***Ornithopus perpusillus.*** **Lark's-foot.** Addle (camp). 1836. Long gone, I fancy. The rustic name is new to me.

530. ***Geum Avens (rivale!)*** Boston Spa — type and monstrous form with well-foliated sepals.

539. ***Potentilla procumbens*** Sibth. Eccup, 1850. The ascription is mine: the specimen is not ordinary *P. Tormentilla*, nor yet *P. reptans*: possibly it is the hybrid between them.

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545. ***Comarum palustre.*** Addle, June 1836.

555. ***Poterium officinale.*** Shepherd's Pond, 1854. The ground has lately been built-over, but it still lingers in damp ground within the rails of the Jowett estate, Harehills (1899).

608. ***Chrysosplenium oppositifolium.*** Roundhay (on lower lake), May 1836. I believe still (1898) at the 'waterfall' foot.

610. ***Parnassia palustris.*** Thorp Arch, 1846, J. D. H.

623. ***Sedum acre.*** Kippax.

633. ***Myriophyllum verticillatum.*** Knostrop, J. D. H. Relegated now to dikes much farther afield. Appears to have been the fine variety, *pectinatum.*

644. ***Lythrum Salicaria.*** Sheepscar beck, 1846. Long gone, too, but up to 1870 or so there was a clump or two every year in a marshy place by the same beck a mile higher up, just at the foot of Sugarhills, by the path between Potternewton and the old toll-bar-house on the Meanwood road. There were specimens of the much rarer *Lythrum Hyssopifolia* in the herb., but *un*localised definitely, though it is not at all improbable it grew in the same quaggy spot alluded to above. The unhandsome *Bidens tripartita* grew by the goit at Sheepscar, near Benson Street, up to 1889.

[646. ***Epilobium angustifolium*** with ***Lathræa squamaria,*** localised Tinsley Park, 1839. The place is near Sheffield.]

664. ***Hydrocotyle vulgaris.*** Addle.

668. ***Sanicula europæa.*** Gipton Wood, 1840.

670. ***Conium maculatum.*** **The Hemlock.** Burley Wood, 1839.

704. ***Œnanthe fistulosa.*** **Water Dropwort.** Swillington. It is remarkable (to me) that there is no specimen of the much more striking and poisonous Cowbane, *Œ. crocata,* which (though now nigh gone) was so fine and abundant (between 1867 and 1876, at any rate) in the swamp below the Adel dam embankment. Can it be that a longer and closer purview on the part of the botanical eye would show that we have herein a completed cycle of plant birth and death? I am disposed to think so. The natural stay of species may be long or short, as with higher things. Twenty years may wipe out almost anything; and I suspect that nearly all Dr. Heaton's active botanising was done in the earlier decades between 1835 and 1865. He was at Adel—always spelled Addle—many times (as specimens prove), but if the Cowbane was *not there then* he could not gather it.

748. ***Galium verum.*** Potternewton, 1836, J. D. H. It was on Sugarhills until 1870.

758*. ***Galium saccharatum*** All. Field near Swillington bridge, 1837. Several specimens of the right plant, a tricorne *Galium* with forward-pointing prickles on leaves, and large tuberculated fruit, but it must I think have been a casual colonist brought with the crop. It has occurred twice in Yorkshire before, near Thirsk and Malton, and in a few other counties, but finds no place in the current London Catalogue.

759. ***Asperula odorata.*** **Woodruffe.** Batty Wood, 1847; and a specimen of *Lathyrus tuberosus* also. Gone now.

761. ***Asperula cynanchica.*** **Quinzy-wort.** Thorparch, August 1836.

770. ***Fedia olitoria.*** **Lamb's Lettuce.** Thorparch, same date. This is another of those 'uncertain' species, requiring recently disturbed and unoccupied ground for their development —bad bearers of competition—the seeds of which Prof. Reid has found in the glacial deposits. Of a surety not in quite the same spot as of old; it may likely be at Thorp-arch yet—such sorts, although easily stamped out for a time, are among the longest-lived of indigenes.

781. ***Eupatorium cannabinum.*** By Nicholson's Lake, Roundhay, 1836, J. D. H. But I was told, a year or two back, that the clumps of this now fringing the water at the lower end of the 'Waterloo' Lake had been purposely introduced during the Corporation's regime.

782. ***Solidago Virgaurea.*** Bramley 'Fall,' no date. Still lingers in the fir plantations at Scotland Mills.

795. ***Gnaphalium dioicum.*** Bramham, no date, J. D. H I saw this up to 1880 on Stubbing Moor, Rigton.

803. ***Conyza squarrosa*** L. **Plowman's Spikenard.** Thorp Arch, no date, J. D. H. Perhaps not gone: still on Horn Bank in 1880.

806. ***Pulicaria dysenterica.*** Whinmoor, 1836, J. D. H.

829. ***Artemisia vulgaris.*** **Mugwort.** Alwoodly banks, 1846.

1017. ***Jasione montana.*** Addle, 1836. Still in the sandy lane beyond 'the crag,' going towards Eccup.

1029. ***Campanula hybrida.*** **Corn Bell-flower.** Thorp Arch. No date.

1038. ***Calluna vulgaris.*** **Common Ling.** Addle, August 1836.

1050. ***Pyrola minor.*** **Least Wintergreen.** Saw-wood, Whinmoor, 1859, J. D. H. Two specimens, queried as to specific name.

1060. ***Hottonia palustris.*** **Water Violet.** Two specimens. One localised 'Brook, near Leeds, J. D. H.;' the other 'Near Knostrop, June 1836.' This and the preceding are among the most significant of changes in the collection.

1061b. ***Primula caulescens*** Koch. Two specimens, labelled '*P. elatior*' which they are not from Thorparch. They are the Primrose-with-Cowslip hybrid, so often miscalled the Oxlip. The Primrose itself grew by the Adel stream, sparingly, in my own recollection, up to about 1867 or 8, when the Reformatory was built.

1068. ***Lysimachia vulgaris.*** **Yellow Loosestrife.** 'Foundry Lane pools' (Osmundthorpe) '1839.' The simple-spiked, half-umbellate, axillary-flowered wild type with very acute leaves and glandular-hairy stem, not the smooth, compound-spiked form mostly seen in gardens.

1077. ***Anagallis tenella.*** **Bog Pimpernel.** Addle bog, near Leeds, 1836. A second more recent specimen—to judge by its fresher appearance—undated, localised similarly. I can just remember this as being there up to 1867.

1081. ***Ligustrum vulgare.*** **Privet.** 'Scarcroft.' Never indigenous there: planted in the fox-covert.

1083. ***Vinca minor.*** **Periwinkle.** Middleton, near Leeds, 1836. This in similar case; but long gone, I should think. On the last occasion when I was over the 'wood,' about 1870, and captured a Green-ringed Snake therein, I saw nothing of it.

1099. ***Menyanthes trifoliata.*** **Buckbean.** Addle, 1836.

1105. ***Symphytum officinale.*** **Comfrey.** 'Sheepscar, J. D. H.'

1115. ***Myosotis palustris.*** **Water Forget-me-not.** Knostrop, 1839, J. D. H.

1129. ***Convolvulus arvensis.*** An unlocalised specimen.

1137. ***Atropa Belladonna.*** **Deadly Nightshade.** Roundhay, 1836. This species, which depends for its uncertain appearances upon soil disturbance, still springs up in unexpected places, with the Giant Throatwort, in and about the Naylor demesne on 'the limehills' between Roundhay and Seacroft, where a patch of Permian strata comes to the surface. Here still, in summer Alexian blue butterflies waver in the

hollows over the Birdsfoot trefoil, and the stars of the Glow-worm shine by hundreds at night amid the undergrowth; and the great hydra-headed clump of Sabine's red rose (*Rosa involuta*) turns every June a succession of flower wheels into prickly purple hubs of fruit. This area, because little meddled with or invaded, remains more nearly what it was fifty years ago than any other spot in the vicinity of Leeds.

1139. ***Hyoscyamus niger.*** **Henbane.** Near mill, Thorp Arch, 1839.

1147. ***Linaria Elatine.*** **Fluellin.** Thorp Arch, no date.

1172. ***Veronica arvensis.*** Back court at Methley Park, July 1848. Several tall, strict specimens 9 inches high. If Dr. Heaton had seen this commonly about Leeds he would not (one would imagine) have thought it worth while to dry (though not affix a name to) this common enough inconspicuous plant. It is one I have constantly sent me to name, or queried '*verna*.' Dr. Heaton though a good general was not a critical botanist.

1194. ***Melampyrum pratense.*** Meanwood, no date. Grows sparingly in the lower part of the wood yet.

1217. ***Verbena officinalis.*** **Vervain.** Thorp Arch, no date.

1237. ***Acinos vulgaris.*** Unlocalised.

1247. ***Scutellaria minor.*** Addle Bog, 1845. There still.

1257. ***Galeopsis Ladanum*** (with *Stachys arvensis*). Scarcroft, 1836.

1260. ***Galeopsis speciosa*** (***versicolor***). Unlocalised. Specimens of *Lamium album* and *L. maculatum* are in the same case. The latter can at best only have been a garden outcast.

1290. ***Scleranthus annuus.*** Meanwood.

1383. ***Parietaria officinalis.*** Kirkstall Abbey, 1836.

1441. ***Epipactis latifolia.*** **Broad-leaved Helleborine.** Roundhay, August 1836. Two specimens.

1442. ***Epipactis violacea*** (queried '*ovalis*'). Thorp Arch, 1849.

1459. ***Ophrys apifera.*** **Bee Orchis.** Scarcroft, 1836.

1462. ***Ophrys muscifera.*** **Fly Orchis.** Scarcroft, June 1835.

1467. ***Habenaria viridis.*** **Frog Orchis.** Roundhay, no date.

1468. ***Habenaria bifolia*** (without name). Addle, 1840, J. D. H.

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1469. ***Habenaria chloroleuca.*** **Butterfly Orchis.** Ilkley, no date.

1493. ***Polygonatum multiflorum.*** Harewood Park, 1849.

1496. ***Convallaria majalis.*** Bolton Woods, May 1848. Becca banks, 1845. (Becca is near Aberford.)

1522. ***Colchicum autumnale.*** Collingham, no date. Still there.

1523. ***Narthecium ossifragum.*** Addle, 1836.

1525. ***Paris quadrifolia.*** Roundhay limehills, no date. A five-leaved specimen.

1565. ***Acorus Calamus.*** **Sweet Flag.** By Aire, Knostrop, 1846.

1576. ***Butomus umbellatus.*** River-side near Swillington. Label, but specimen missing.

1577. ***Triglochin palustre.*** Addle, 1847.

1581. ***Potamogeton plantagineus?*** Sherburn, J. D. H. The specimen is queried '*rufescens,*' which it is not; a mere scrap, it has more the facies of small *polygonifolius.*

1587. ***Potamogeton heterophyllus*** (labelled *lucens*). Near Swillington Bridge, July 1846. An interesting posthumous record for a rareish species, which I fear cannot exist now. There are also unlocalised examples of *Pot. pusillus* and *P. pectinatus*, probably from the same place.

1772. ***Cynosurus echinatus.***

1790. ***Briza minor.***

1799. ***Hordeum murinum.*** Field near Swillington bridge, July 1846, J. D. H. These three grasses doubtless casual aliens, and from same field as the *Galium saccharatum,* already dealt with.

1906. ***Osmunda regalis.*** **King Fern.** By pools, Osmondthorpe, July 1840. A monstrous specimen, chosen for its 'foliation of the fructiferous spike.' Sixty years ago! one wonders, *en passant,* if there be any connection between the name and locality—the latter is anything but the thorpe of the *Osmunda* now.

1907. ***Ophioglossum vulgatum.*** Addle, no date.

1909. ***Botrychium lunaria.*** Blackmoor, no date. A fine specimen, with deeply incised lunations of frond and much divided spike, but not after the axial manner of *matricariifolium.*

1924. ***Lycopodium clavatum.*** Addel Moor, 1847, J. D. H. Just within my memory this grew—to about 1865 or 1866—in

the rough steep field on the right hand going down to Scotland Mill from Penyfynnon.

And that is the tale of these relics of the flora of Old Leeds. There is something pathetic in the contemplation of the fact that, with a few exceptions, every one of them has passed away for ever, to take, with the lapse of time, a position in the dusty archives of science-fact similar to those impressions of *Calamites* and *Sigillaria* on the coal-measure wallstones of our rockeries and museums. Both alike determinatively existed, and even the botanist may be permitted some sentiment over what is implied in the removal of natural landmarks. Decade by decade, one by one they disappear, like the ugly black cannon-ball-headed iron bollards on the edge of the pavements at the street corners of our city, natural and artificial, as the fashion or their reign of purpose is over, with nothing save surveying semi-omniscient Intelligence to tell their story, and interpret (it may be) the meaning of these lights of other days.

NOTES—ORNITHOLOGY.

Cormorant at Horncastle.—A specimen of the Common Cormorant (*Phalacrocorax carbo*) was recently shot, in the Brickyard Pits, at Horncastle, being doubtless driven inland by the recent gales. It is now in my possession.—J. Conway Walter, Langton Rectory, Horncastle, 27th January 1900.

Kingfishers in Winter at Horncastle.—During this winter a pair of Kingfishers (*Alcedo ispida*) have been frequently seen in the middle of the town (Horncastle), sitting on rails by the canal, which passes the yard of Mr. Garton, stonemason, West Street. Another specimen is frequently seen, sitting on garden rails, by another branch of the canal, in the south part of the town. They are becoming tame, and the people feed them with scraps of meat, etc.—J. Conway Walter, Langton Rectory, Horncastle, 27th January 1900.

NOTES AND NEWS.

The Geological Society has awarded the Lyell Medal for the present year to J. E. Marr, M.A., F.R.S., F.G.S., whose numerous contributions to the physical and stratigraphical geology and palæontology of the Lake District are well known to our geological readers.

Mr. W. Hodgson, A.L.S., is, we see by the 'Workington Star,' of 5th January, to supply the botanical portion to the Cumberland volume of the new 'County History' series. The only regret we have is that, although the work will be in safe hands, the readers of the book cannot realise the personality of the veteran who, born in 1824, is still actively interested in his favourite pursuits.

NOTE—MAMMALIA.

Badger in County Durham.—A very fine full-growu male Badger (*Meles meles*), weighing 20 lbs., and very fat, was caught on Friday, 5th January 1900, on the Woodlands estate, between Satley and Consett, in West Durham, by Mr. J. Earle, gamekeeper to Mr. W. B. Van Hansbergen, J.P., while trapping rabbits. This animal is also found in the quieter parts of the valleys of the Upper Derwent, Upper Wear, and Upper Tees. I have records of no less than sixteen having been captured in these localities since 1880.—J. W. FAWCETT, Satley, Darlington, 20th January 1900.

NOTE—LEPIDOPTERA.

***Vanessa antiopa* at Huddersfield.**—The proverbial luck of the beginner is well illustrated by the following. Yesterday, Mr. T. P. Crosland, J.P., of this town, called with his son, Arthur Clive Crosland, a boy of ten years old, to show me a specimen of *Vanessa antiopa* the latter had captured in a field off Trinity Street, Huddersfield, on 31st October last. The boy said he had caught it with his cap, and that 'it took a good deal of catching.' I know of no previous occurrence in this district since 1872, but the past autumn was evidently an exceptionally good one for the species of the genus *Vanessa,* as indicated by the large numbers which frequented our gardens. I omitted to state in my note (Nat., January 1900, p. 16) that *Vanessa urticæ* also occurred, I believe not uncommonly, along with the *V. atalanta* and *V. io,* it also now being comparatively seldom seen here.—GEO. T. PORRITT, Huddersfield, 5th January 1900.

NOTE—DIPTERA.

The Celery Fly: Ravages at Huddersfield.—We had exactly the same experience here with the Celery Fly (*Tephritis onopordinis*) as is recorded by Mr. J. W. Carter (Nat., January 1900, p. 2). We had an unusually large quantity of young celery, of several varieties, planted out last year, and for a time all appeared to be going on well with them: then the brown blotches appeared on the leaves of every plant, and soon nothing but the stiff ends of the stalks were to be seen above ground. The effect produced on the bunches was that they were short in growth, and being only about a quarter or less of the thickness they ought to have been, were not worth gathering. I am told all the growers of celery in this district had a similar experience, though in my own case at any rate, nothing of the kind had been noticed in previous years.—GEO. T. PORRITT, Crosland Hall, Huddersfield, 5th January 1900.

NOTE—POLYZOA.

Polyzoa, etc., at Southport.—The few mentions of Southport Polyzoa in Vol. I. of the 'Fauna of Liverpool Bay,' 1886, embolden me to send the following short list of a gathering in April 1898. I should not advise anyone to collect on the sands at Birkdale, a place where, when I was there, dead dogs, cats, and sea birds, besides other refuse, were more conspicuous than the species which interested me; fortunately the dry shifting sand acted as a mummifier.

Flustra foliacea L. Birkdale; Southport.
Membranipora membranacea L. Birkdale; Southport.
Scrupocellaria reptans L. Southport.
Amathia lendigera L. Birkdale; Southport.
Sertularia operculata L. Southport.
Hydrallmania falcata L. Birkdale; Southport.

—S. L. PETTY, Ulverston, 16th January 1900.

IRIS SPURIA:
A LINCOLNSHIRE ESCAPE.

F. M. BURTON, F.L.S., F.G.S.,
Highfield, Gainsborough, Lincolnshire.

Four years ago, while at Sutton, on the Lincolnshire coast, I received from my friend, the Rev. W. T. Jennings, Vicar of Huttoft, the flowers of an *Iris,* which he said he had seen growing in considerable quantity in the marshes adjoining the coast, and which he said were annually gathered by children for their school feast. I went over soon after to the place and found the *Iris* growing on ditch sides with the ordinary Yellow Flag, *Iris pseud-acorus,* and, though it was somewhat late in the year for the flowers, and they had been mostly gathered by the children a week or two before, I found some in places where they were difficult to reach; while from one of the plants I managed to hack off a piece with some pretensions to a root on it, and planted it afterwards in my garden (which is a sanctuary for many a rare British plant, as it is for numerous other perennials and Alpines), where it grew and prospered.

When I first received the flowers from Mr. Jennings I sent some of them to the Hon. Sec. of the Lincolnshire Naturalists' Union, who forwarded them to a great and well-known authority for identification; but, whether the specimens sent had lost their character by keeping, or for some other reason were not easily distinguishable, I know not, the fact remains that he named it *Iris fœtidissima.* Last year my plant flowered and I sent a spike up to Kew, and, in a day or two, received the usual courteous form signed by the Director, W. T. Thiselton-Dyer, with the name '*Iris spuria* var.' noted on it. This year my plant failed to flower, probably owing to my having moved it the year before, so I wrote to my friend at Huttoft again asking him to procure more flowers for me, which he very kindly did, and I sent them up to Sir Michael Foster, whose interest in Irises is well known, and whose knowledge of them is shown by his able monograph on 'Bulbous Irises,' published by the Royal Horticultural Society. In a few days I received his reply, and as it is of much interest I quote it in full:

'July 1, Nine Wells, Great Shelford, Cambridge.

'Dear Sir,—'Owing to the *Iris* being sent to Trinity College (instead of my private address) there has been some delay in its coming into my hands. It is undoubtedly one of the many forms of *I. spuria.* There are two or three European forms and

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many Asian forms. This seems to be one of the *Asian* forms. It is, of course, an escape from cultivation. It is so marked an instance of escape that it would be worth while for some of you to investigate the case, and if possible find out how it got there.

'I have never known birds take the seed of this kind of *Iris* (or indeed of any other), so either the roots or the seed must have got there in some other way. It is not likely to have come from an ordinary garden, since it is a form of *Iris* not much cultivated. Is there any history of any garden either near—or so related to the spot that the transmission of roots or seeds may seem likely? One way in which garden bulbs escape is by the young plants for a hedge, or young shrubs, being taken from a nursery garden, and the small bulbs being carried in the soil round their roots; but this would not explain this case. I hope some one will worry it out. . . . 'M. Foster.

'—— (*the authority in question*) could never have called this *I. fœtidissima*; it is wholly unlike.'

To this I replied that the place where the plant occurs is a seldom-visited part of the marsh land of Lincolnshire between the wolds and the sea (indeed, no one but a naturalist and those who farm the land would go there); that it was impossible the plants had escaped from any nursery garden; and that, with the exception of a few thinly-scattered farm-houses and a cottage or two, and a coastguard station, none of which were at all near the specimens I found, no habitations existed near the spot; and I suggested, as a possible solution, that some sailor-son might have brought a plant over for his mother's garden and afterwards cast it away, or planted it in a place which appeared to him likely for it to grow in. However this may be, there is no doubt that it has been flourishing where it occurs for a very long time, as no one who has seen the plants growing can doubt, for they are found on the ditches and sides of the ponds around, and are thoroughly established in the locality. Mr. Jennings says the plants occur, to his knowledge, in three different places within the radius of about a mile, all in the parish of Huttoft.

It is always a matter of interest trying to find out how escapes originate, and especially such an escape as this. The plant is not a likely one to be grown by any except collectors and enthusiasts. The flowers are not very striking, though these in question are the most highly coloured of any I ever met with, and I grow several forms of the type. Altogether it is a remarkable and notable escape, and to use Sir Michael Foster's words, it is quite worth while for some of the members of the Lincolnshire Naturalists' Union 'to investigate the case, and if possible find out how it got there.' *31st July 1899.*

Naturalist.

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North Lancashire Varieties of the Common Polypody.—S. Lister Petty.

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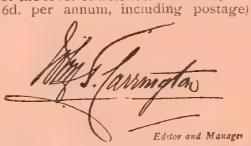

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LAND AND FRESHWATER MOLLUSCA IN NORTHUMBERLAND,

COLLECTED CHIEFLY AT CORBRIDGE-ON-TYNE AND ON THE LOWER TWEED.

Miss M. V. LEBOUR,
Radcliffe House, Corbridge-on-Tyne, Northumberland.

The following notes are the result of several years' collecting in the valley of the Tyne round about Corbridge and on the south banks of the Tweed between Horncliff and Berwick, and include some forms hitherto regarded as rare in Northumberland, but now shown to be abundant in some special localities. The locality at which *Succinea putris* was found, is, however, just north of Berwick, but still in England.

Arion ater (L.). Very common, Corbridge.

Arion subfuscus (Drap.). Not common, Fell, Corbridge.

Limax maximus (L.). Common, Corbridge.

Agriolimax agrestis (L.). Common, Corbridge.

Vitrina pellucida (Müller). Common, Corbridge, in the garden in damp places under roots of plants, and in woods under trees. Two specimens found in Aydon Dene with shell capable of containing entire body.

Hyalinia cellaria (Müller). Common, Corbridge, in the garden under stones and at the roots of plants.

Hyalinia crystallina (Müller). Common, Corbridge, among moss and roots of plants, and under stones in the garden.

Hyalinia nitidula (Drap.). Very common, in moss and roots of plants and under stones, Corbridge.

Hyalinia pura (Alder). Common, in moss in old wall near station, Corbridge.

Helix rotundata (Müller). Very common, Corbridge, in moss, roots, and under stones.

Var. ***turtoni*** (Flem.). Not common.

Helix aspersa (Müller). Very common in all gardens.

Helix granulata (Alder). Not common, Aydon Dene, crawling up plants.

Helix nemoralis (L.). Not common at Corbridge; very common on links on the coast.

Helix hortensis (Müller). Very common, Corbridge, in hedges.

Var. ***olivacea***. One specimen.

1900 March 2.

Helix arbustorum (L.). Very common in woods under trees, Corbridge.

Helix cantiana (Montagu). Abundant in Aydon Lane, Corbridge, nearly all varieties merging into each other, from nearly white to var. *rubescens* and *albocincta* combined. I have noticed broken bits of this shell near stones, as if birds had been eating them, a fact which Mr. L. E. Adams has 'never observed' ('Collectors' Manual of British Land and Freshwater Shells,' p. 75). This species is very local. This locality is, or rather was, when the specimens were first collected there, quite away from gardens, and there seems to be no reason to regard the species as other than native to the district. It has been recorded moreover from Northumberland by both Alder and Adams.

Helix rufescens (Pennant). Very common, Corbridge, garden; several specimens slightly distorted.

VAR. ***albocincta.*** Commoner than type.

VAR. ***alba.*** Not common.

Helix hispida (L.). Common, in moss and roots and under stones, Corbridge.

VAR. ***alba.*** Not common.

Helix caperata (Montagu). Common, among roots of plants, garden, Corbridge.

Helix virgata (DaCosta). Abundant on banks by the side of Hexham Road, near a stone wall.

VAR. ***albida.*** Common. This species is very local at Corbridge; very common on links on coast with *H. nemoralis*.

Helix pulchella (Müller). Common in garden, Corbridge, under stones.

VAR. ***costata.*** Commoner than type. In old stone wall, Dilston, Corbridge.

Buliminus obscurus (Drap.). Fairly common under trees, Corbridge.

Pupa cylindracea (DaCosta). Very common in stone walls and among stones and roots, Corbridge.

VAR. ***edentula.*** Common.

Pupa muscorum (L.). Not common, under stones, garden, Corbridge.

Balea perversa (L.). Abundant in lime in wall in the garden, Corbridge. Very fine specimens, measuring on an average

6 to 7 mm. in length. Species very local. The shells live in very narrow holes in the wall, from which they only emerge after rain.

Clausilia bidentata (Strom). Common, among stones, Corbridge.

Clausilia laminata (Montagu). Very common, at roots of trees in woods, Corbridge.

Cochlicopa lubrica (Müller). Very common, in moss and roots, Corbridge.

Succinea putris (L.). Very common, in grass near a small spring close to the beach, Berwick-on-Tweed. Very fine specimens.

Carychium minimum (Müller). Not common, in moss on old stone wall, Corbridge.

Limnæa peregra (Müller). Very common everywhere.

Limnæa palustris (Müller). Not common, very local. Several specimens in small stream across a lane, Corbridge; stream since been blocked. Species no longer to be found there.

Limnæa truncatula (Müller). Common, muddy ditches, Corbridge, dirty black bogs in wood near Hexham, with innumerable tadpoles for companions, but no other shells. Very common in mud between high and low water marks of tidal parts of river Tweed.

Physa fontinalis (L.). Very common on leaves floating in water, river Tweed, Chain Bridge.

Planorbis parvus (Say). Not common, ponds in Whittle Dene, Ovingham.

Ancylus fluviatilis (Müller). Very common nearly everywhere in rivers and running streams.

Valvata piscinalis (Müller). Very common, Chain Bridge, in river Tweed.

Pisidium amnicum (Müller). Common, river Tyne, Corbridge, and river Tweed, Chain Bridge.

Pisidium fontinale (Drap.). Very common, bogs, ditches, and streams nearly everywhere.

Pisidium nitidum (Jenyns). Not common, river Tyne, Corbridge, and river Tweed, Chain Bridge.

Sphærium corneum (L.). Very common, river Tweed, Chain Bridge.

Anodonta cygnea (L.). Common, river Tweed, Chain Bridge.

Anodonta anatina (L.). Very common, river Tweed, Chain Bridge.

NOTES—MAMMALIA.

Badgers near Horncastle.—During the winter a pair of badgers (*Meles meles*) have been seen in the plantations at Scrafield, about four miles east of this; and one has been recently trapped in Scrivelsby, three miles distant.

On Monday, 25th September 1899, our Southwold hounds, when cub-hunting at Tathwell, started a fine badger, which gave a good run before it was finally run into and despatched.—J. CONWAY WALTER, Langton Rectory, Horncastle, 17th February 1900.

Otter on Simon's Fell, Ingleborough.—A female Otter (*Lutra lutra*) was recently shot on this spur of Ingleborough at an elevation of 2,000 feet; it weighed nearly 10 lb. From traces in the snow it was evidently following the course of a mountain stream.—J. WALLING HANDBY, Austwick, Lancaster, 13th February 1900.

Foxes on Ingleborough.—Latterly Foxes (*Vulpes vulpes*) have become somewhat numerous in this locality. Their chief haunt is a spot known as the 'Arks,' a tumbled mass of Silurian boulders on the N.E. side of the peak. Here during summer, when the eye rests upon immeasurable vistas of rugged hills and heather-clad lowland vales, Reynard finds a hiding-place. When winter comes and snow covers the ground he is traced to his lair by keepers who place themselves in positions amongst the rocks to shoot their quarry when bolted by dogs. It is somewhat exciting sport, requiring at times much endurance to withstand the almost Arctic cold which generally prevails at that altitude during winter. Two recent captures, both dogs, weighed 18 lb. and 16½ lb. respectively, and, in pursuance of an old custom, were exhibited at the leading farmhouses, a small gratuity being invariably paid to the exhibitor, presumably as a sort of toll.—J. WALLING HANDBY, Austwick, Lancaster, 13th February 1900.

NOTE—GEOLOGY.

Moraine at Filey.—The visitor to Filey who wishes to obtain a bird's-eye view of the great moraine which dammed back the waters of the Rye, and converted the estuary of the Vale of Pickering into a vast lake, should start from Gristhorpe Station on the N.E.R. and, passing through the village of Gristhorpe, make for a white farmhouse in the direction of the cliffs. Turning then to the right across a field, he will reach a point not far from the Wyke, where he can see below him the long curved ridge of the moraine, stretching from near Gristhorpe, through Muston, to Hunmanby Gap. From no other standpoint is this moraine so distinctly revealed.

That this moraine was once considerably higher is probable from the fact that the southern portion of it is continued on the very top of the Chalk Wolds to Speeton Mill, at an elevation of over 400 feet. Sub-aerial denudation has considerably lowered it, but it was sufficient at the time, in combination with the ice-wall of the Scandinavian glacier, to produce the effects noted above in the first paragraph. From this ice-wall, beside the quantity of sand, gravel, and boulders, which constitute a moraine, a vast amount of intensely muddy water was always escaping, which, in the comparative stillness between the ice-front and the moraine, or between the ice-front and higher land, gradually sank and accumulated, containing innumerable stones and boulders, dropped haphazard into the mass of mud. This constitutes the Boulder Clay Cliffs of Yorkshire, the clay itself seldom extending far inland except in Holderness, which was only a wide bay of the sea.

Probably the glacier, in advancing or retreating, by its weight consolidated this mud, which in places is very compact, especially at Carr Naze, Filey, but throughout Yorkshire the boulder clay is so intermixed with streaks of sand and laminated clays, that I cannot believe that it was formed under similar conditions to the Scottish Till, which is almost as hard as cement.—EDWARD MAULE COLE, Wetwang, 12th February 1900.

MOSSES OF THE MERSEY PROVINCE.

J. A. WHELDON,
Liverpool.

As efforts are now being made to work out the distribution of British Mosses on similar lines to those adopted for Phanerogamic plants, it is incumbent upon all local botanists who are interested in this section of our flora, to render such assistance as lies in their power.

Considerable portions of the Mersey Province have been worked with some degree of completeness, and therefore it is possible to compare the lists of species reported from each of the three vice-counties comprised within its limits, viz., Cheshire, and South and West Lancashire. By means of such a comparison, we may be able to indicate the probable occurrence of some species in portions of the province from which they are hitherto unrecorded; and it is hoped the lists here given will be of some service to busy field botanists, by directing their search for missing links in the chain of species. Many of these unrecorded species will no doubt ultimately be found; some, indeed, may have been already noticed by collectors, who have perhaps thought them unworthy of public record.

In preparing statistics of plants, the 'species' difficulty crops up at once. This may be overcome sufficiently for my present purpose, by considering species and sub-species as of equal value, and treating varieties separately. It must be remembered, therefore, in comparing the following tables with lists from other areas, that the term 'species' comprises many forms looked upon by some botanists as of only subordinate rank, but which are nevertheless differentiated to a higher degree than occurs in the lower categories of 'varieties' and 'forms.'

The following table indicates the number of species and varieties recorded for the whole province, and also for its three main sub-divisions.

	District.	Species.	Varieties.	Total.
58.	Cheshire	269	47	316
59.	South Lancashire ...	260	65	325
60.	West Lancashire ...	260	84	344
	Mersey Province ...	345	123	468

1900 March 2.

On studying this table it will be seen that the figures for the three sub-divisions approximate so closely, that the slight difference between them may be well considered to be due to the varying degrees of assiduity with which they have been explored. Apparently Cheshire is the richest in species, and the relatively small number of varietal forms recorded therefrom probably does not truly reflect the proportion in which they occur. Probably the least attention has been devoted to West Lancashire, and that portion of South Lancashire not embraced in the areas covered by the floras of the Manchester and Liverpool Field Clubs. Around each of these cities, including part of Cheshire and South Lancashire, appears to have been carefully and exhaustively investigated.

Only 184 species have been ascertained to occur in all three vice-counties, and if we add to these 16 varieties, we have a total of 200 forms (or less than half) which are common to the three minor divisions of the province.

Proceeding from the most general to the most local forms, we present the following table of species which have been recorded from one vice-county only, and are apparently absent from the other two. Further careful work will probably considerably modify these figures.

Mosses Found in One Vice-County Only.

District.	Species.	Varieties.	Total.
58. Cheshire	39	14	53
59. South Lancashire ...	13	17	30
60. West Lancashire ...	28	36	64

A complete list of these species will be found below, but of the varieties, many of which are unimportant, only the more interesting are enumerated.

I. Recorded from Cheshire Only.

Species.

Sphagnum rigidum (type).
Sphagnum teres (type).
Buxbaumia aphylla.
Ditrichum tenuifolium.
Cynodontium Bruntoni.
Dicranodontium longirostre (type).
Dicranum Scottianum.
Racomitrium ellipticum.
Campylostelium saxicola.
Pottia lanceolata.
Tortula marginata.
Tortula angustata.
Weisia mucronata.
Weisia rostellata.

Weisia multicapsularis.
Ulota phyllantha.
Orthotrichum tenellum.
Orthotrichum patens.
Orthotrichum pulchellum.
Orthotrichum fastigiatum.
Ephemerum sessile.
Physcomitrella patens.
Physcomitrium sphæricum.
Funaria ericetorum.
Paludella squarrosa.
Philonotis cæspitosa.
Philonotis capillaris.
Philonotis calcarea.
Orthodontium gracile.
Bryum pallescens.
Cryphæa heteromalla.
Neckera pumila.
Thuidium Blandowii.
Camptothecium nitens.
Brachythecium campestre.
Scleropodium cæspitosum.
Eurhynchium tenellum.
Eurhynchium Teesdalei.
Plagiothecium latebricola.
Amblystegium fluviatile.
Hypnum Sommerfelti.
Hypnum vernicosum.

Varieties.

Sphagnum recurvum var. riparioides.
Catharinea crispa var. densifolia.
Fissidens pusillus var. Lylei.
Fissidens viridulus var. madidus.
Tortula subulata var. subinermis.
Hypnum aduncum vars. pungens and pseudofontanum.
Hypnum fluitans var. Holtii.

II. Recorded from South Lancashire Only.

Species.

Dicranoweissia crispula.
Blindia acuta.
Trichostomum tenuirostre.
Barbula Hornschuchiana.
Catoscopium nigricans.
Webera commutata.
Bryum Marrattii.
Bryum calophyllum.
Bryum Donianum.
Bryum neodamense.
Bryum filiforme.
Myrinia pulvinata.
Amblystegium Sprucei.

Varieties.

Sphagnum teres var. squarrosulum.
Catharinea undulata var. Haussknechtii.
Amblystegium radicale var. serotinum.
Hypnum aduncum vars. tenue, aquaticum and polycarpum.
Plagiothecium sylvaticum var. succulentum.

III. Recorded from West Lancashire Only.

Species.

Sphagnum rubellum.
Sphagnum medium.
Sphagnum molle.
Andræa petrophila.
Polytrichum alpinum.
Weisia crispata.
Campylopus atrovirens.
Fissidens decipiens.
Seligeria pusilla.
Swartzia montana.
Barbula lurida.
Barbula recurvifolia.
Barbula lævipila.
Barbula papillosa.
Encalypta vulgaris.
Zygodon viridissimus.
Orthotrichum rupestre.
Orthotrichum stramineum.
Orthotrichum Lyellii.
Funaria calcarea.
Bartramia ithyphylla.
Bartramia Œderi.
Zieria julacea.
Bryum alpinum.

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Mnium orthorrhynchum.
Orthothecium intricatum.
Eurhynchium hians.
Hylocomium rugosum.

VARIETIES.

Sphagnum papillosum var. confertum.
Sphagnum teres var. subteres.
Sphagnum rigidum var. compactum.
Dicranodontium longirostre var. alpinum.
Campylopus flexuosus var. paradoxus.
Racomitrium heterostichum vars. alopecurum and gracilescens.
Orthotrichum affine var. rivale.
Fontinalis antipyretica var. gracilis.
Eurhynchium murale var. complanatum.
Hypnum aduncum var. flexile.
Hypnum fluitans var. gracile.
Hypnum ochraceum var. flaccidum.

The next table indicates the number of species and varieties common to two, but hitherto unrecorded from one only, of our vice-counties.

MOSSES ABSENT FROM ONE VICE-COUNTY ONLY.

DISTRICT.	SPECIES.	VARIETIES.	TOTAL.
58. Cheshire	33	22	55
59. South Lancashire ...	14	7	21
60. West Lancashire ...	30	10	40

It is probable that careful search will reveal the fact that in many cases this absence from one sub-district is more apparent than real, owing to insufficient investigation. The following is a detailed list of the species, but, as before, only a selection from the varieties is given.

I. ABSENT FROM CHESHIRE, BUT RECORDED FOR V.C. 59 AND 60.

SPECIES.

Pottia recta.
Trichostomum crispulum.
Trichostomum nitidum.
Trichostomum littorale.
Barbula spadicea.
Barbula vinealis.
Barbula ruralis.
Barbula intermedia.
Grimmia Doniana.
Racomitrium aciculare.
Racomitrium heterostichum.
Amphoridium Mougeotii.
Orthotrichum cupulatum.
Meesea uliginosa.
Webera elongata.
Webera cruda.
Bryum Warneum.
Bryum affine.
Mnium serratum.
Mnium stellare.
Fontinalis squamosa.
Neckera crispa.
Thuidium recognitum.
Eurhynchium crassinervium.
Eurhynchium piliferum.
Plagiothecium pulchellum.
Plagiothecium sylvaticum.
Hypnum elodes.
Hypnum protensum.
Hypnum Wilsoni.
Hypnum lycopodioides.
Hypnum falcatum.
Hypnum brevirostrum.

Varieties.

Sphagnum cymbifolium var. congestum.
Dichodontium pellucidum var. fagimontanum.
Dicranum scoparium vars. turfosum and orthophyllum.
Tortula muralis var. rupestris.
Trichostomum tortuosum var. fragilifolium.
Bryum ventricosum var. compactum.
Brachythecium rutabulum var. robustum.
Amblystegium serpens var. depauperatum.
Amblystegium filicinum var. Whiteheadii.
Hypnum aduncum var. paternum.
Hypnum Wilsoni var. hamatum.
Hypnum fluitans var. obsoletum.
Hypnum exannulatum var. brachydictyon.

II. Absent from South Lancashire, but Recorded from V.C. 58 and 60.

Species.

Andræa Rothii.
Andræa crassinervis.
Sphagnum tenellum.
Sphagnum laricinum.
Dicranodontium longirostre (aggr.).
Campylopus brevipilus.
Dicranum fuscescens.
Racomitrium lanuginosum.
Ulota Bruchii.
Bryum murale.
Polytrichum formosum.
Polytrichum strictum.
Amblystegium irriguum.
Hypnum ochraceum.

Varieties.

Sphagnum subsecundum var. viride.
Sphagnum intermedium var. pulchrum.
Dicranum fuscescens var. falcifolium.
Hypnum fluitans var. paludosum.

III. Absent from West Lancashire, but Recorded from V.C. 58 and 59.

Species.

Archidium alternifolium.
Polytrichum nanum.
Weisia crispa.
Weisia tenuis.
Dicranella crispa.
Dicranella secunda.
Dicranum Bergeri.
Fissidens pusillus.
Fissidens tamarindifolius.
Fissidens crassipes.
Fissidens osmundioides.
Blindia trichodes.
Pleuridium axillare.
Acaulon muticum.
Pottia intermedia.
Pottia Wilsoni.
Pottia pusilla.
Tortula rigida.
Grimmia trichophylla.
Zygodon conoideus.
Ulota crispa.
Schistostega osmundacea.
Splachnum sphæricum.
Splachnum ampullaceum.
Physcomitrium pyriforme.
Funaria Templetoni.
Funaria fascicularis.
Aulacomnium androgynum.
Bryum turbinatum.
Amblystegium varium.

Varieties.

Sphagnum squarrosum var. imbricatum.
Sphagnum cuspidatum var. majus.
Polytrichum aloides var. Dicksoni.
Dicranum Schreberi var. elatum.
Hypnum aduncum var. intermedium.

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Some of the corticolous and lowland paludal species of Cheshire will probably never be found elsewhere in the province; West Lancashire will also, perhaps, always retain a preponderance of the xerophilous species, restricted to its hills of Scar Limestone; and the sandhill tracts of South Lancashire will probably always furnish a few species not to be found in the smaller similar areas to the North and South. Eliminating these exceptional districts, the three vice-counties present many identical features, which would lead us to infer that the list of species common to all our sub-divisions will be largely increased by further investigation.

NOTES—DIPTERA.

Celery Fly: Ravages in North Lancashire.—I believe this district has, too, paid the penalty. Many trenches which I saw last autumn were completely ruined by *Tephritis onopordinis*; in one Ulverston garden, where the vegetable was grown for market, almost all was unfit for use. All the same, it is almost certain nothing will be done to remedy the infliction, or even to attempt such, in the coming season.—S. L. Petty, Ulverston, 3rd February 1900.

Food of the Common Bluebottle: a Query.—This season I received some scores of young Pheasants, Partridges, and Grouse which had died of enteritis, from England, Scotland, and Ireland. These, after examination and dissection, were buried in my garden at a good depth. In August and September the larvæ of the Common Bluebottle (*Calliphora erythrocephala* Mg.) were to be found just under the soil by the hundred. I sent them to my friend, the Rev. A. Thornley, who kept them to maturity. As they were never found deep enough to feed on the decaying game, as I carefully ascertained, on what did they feed? I cannot understand.—E. Adrian Woodruffe-Peacock, Cadney, Brigg, 9th February 1900

NOTE—BOTANY.

Cow Parsnip: Phyto-philology in Lincolnshire.—This plant (*Heracleum Sphondylium* L.) in Lincolnshire rejoices in many names. To one, 'Cow-Bumble,' I want to call attention on account of its philology. The true 'Hemlock' of Lincolnshire is *Chærophyllum sylvestre,* and the plant which heads this article is the Cow Hemlock or Humlock, Humleck, Humlick, Humble, Anumble or Bumble. All these forms are to be heard used by the country folk. 'I'm a getherin' *Humbles* fer th' rabbits,' is not an uncommon phrase in the spring of the year. The change from Hemlock to Humble or Bumble can be equalled in our dialect. Who but a native could imagine that the simple abbreviated Christian name Pot was short for Ferdinand. Yet it comes about by the following changes:—Ferdinand, Ferdin, Ferden, Ferdum, Ferdon. The next transition is the change of the Fer into Fod; this again turns into Pot, and thus leaves Pottun, Potten, Pottin, Pottan, which is finally shortened into Pot—the well-known household utensil. In my experience this can only be equalled by the local farrier, who, when writing a receipt in which bichromate of potash was used, wrote it 'Bitch's comet of pot-arse.' The surname Drayton passes through similar changes, becoming Dratton, Ratton, Rat'un. My native village Bottesford is another example to the point; in speaking and writing we hear and see these different forms, Bottsford, Bottsforth, Bottsfurth, Bottsworth, Bottswath, and Botsfud.—Max Peacock, Cadney, Brigg, 13th February 1900.

LINCOLNSHIRE NATURALISTS AT SOMERCOTES AND SALTFLEETBY.

Rev. EDWARD ADRIAN WOODRUFFE-PEACOCK, L.Th., F.L.S., F.G.S.,
Vicar of Cadney; Organising and Botanical Secretary, Lincolnshire Naturalists' Union.

The twenty-first meeting of the Union was held on Thursday, 8th June, at Somercotes and Saltfleetby on the Lincolnshire coast.

Amongst those who were present were the late Mr. John Cordeaux, M.B.O.U., Vice-President of the Union; Mr. E. Kyme Cordeaux (Brackenborough Hall); Mr. F. M. Burton (Gainsborough); Rev. W. Fowler (Liversedge); Rev. W. W. Mason (Bootle); Rev. A. Thornley (South Leverton); Mr. J. S. Sneath (Lincoln); Dr. Cassall (Ashby); Rev. E. A. Woodruffe-Peacock, Hon. Organising Secretary (Cadney); Mr. W. Lewington (Market Rasen); Rev. T. Hill (North Somercotes); Rev. S. Bateman and Miss Bateman (Yarborough); Rev. T. Longley (Conisholme); Rev. H. Garrett (North Thoresby); Rev. J. Conway Walter (Langton); Mr. F. W. Riggall and Mr. A. Smith (Grimsby); Mr. T. Gelsthorp, Mr. R. Muir, Mr. and Mrs. J. Larder, Miss Crow, Miss Lambden, Mr. G. H. Kiddall, Mr. B. Crow, Mr. H. F. V. Falkner, Mr. H. D. Simpson, Mr. V. T. Crow, and Mr. R. W. Goulding, Hon. Assist. Secretary (Louth).

The starting point was Louth Railway Station, and the drive in carriages lay across the great Boulder Clay bed, which overlies the incline of the Chalk. This is locally called the 'Middle Marsh' or 'Clays.' When this was left behind, the true Silt Marsh, made from the denudation of the Boulder Clay, stretched right up to the coast sandhills, which are nothing more than the detritus of the frost-shattered flints derived directly from the Boulder Clay, but originally from the Chalk.

The day was dull, cold, and threatening, but continued fine. About 220 species of plants were added to my register, thanks to the energy of the Rev. W. W. Mason. The most interesting were as follows:

Ranunculus circinatus.
Ranunculus trichophyllus.
Ranunculus Baudotii, found in both varieties, vulgaris and confusus.
Sisymbrium sophia.
Cerastium semidecandrum.
Trifolium scabrum.
Saxifraga tridactylites.
Myriophyllum spicatum.
Apium inundatum.
Galium elongatum.
Myosotis collina.
Myosotis versicolor.
Lycium barbarum.

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Limnanthes Douglasii.
Lamium amplexicaule, which is generally found as a railway ballast casual in this county.
Parietaria officinalis.
Alnus glutinosa.
Hydrocharis Morsus-ranæ.
Orchis incarnata.
Ophioglossum vulgatum.

An unusually good list for the season and soils.

Mr. Mason, too, was indefatigable in collecting Mosses, and this is his list. But the best thing was not included, *Hypnum Wilsoni* Schimp., but I find it recorded in 'The Journal of Botany,' 1899, p. 360, on the authority of Mr. J. A. Wheldon. The others are :—

Ditrichum flexicaule.
Ceratodon purpurens.
Tortula muralis.
Tortula ruraliformis.
Barbula tophacea.
Bryum pendulum.
Bryum lacustre.
Bryum cæspiticium.
Bryum capillare.
Climacium dendroides.
Camptothecium lutescens.
Brachythecium rutabulum.
Brachythecium velutinum.
Hypnum ruparium.
Hypnum aduncum.
Hypnum falcatum.
Hypnum cupressiforme.
Hypnum cordifolium.
Hypnum cuspidatum.
Hylocomium squarrosum.
Hylocomium triquetrum.

The Rev. W. Fowler noted the following :—

Lichens.	Fungus.
Cladonia pyxidata.	Puccinia caricis. Teleutospores on various Carices (July to April). Æcidiospores on Urtica dioica (May and June).
Cladonia rangiferina.	

Ornithology.—This list of birds observed is the last piece of scientific work Mr. Cordeaux did. It runs as follows:—Without counting the more common and generally distributed, the birds seen included about 25 species. On the Somercotes rabbit warrens and sandhills south of Saltfleetby, four species which nest underground have their home. These are the Sand-Martin, excavating holes in the steep sides of the dune, often to a considerable depth ; the other three are the Wheatear, Stockdove, and Sheld-Duck, which utilise rabbit burrows for nesting purposes. The former are particularly plentiful on the warrens. On the fitties and foreshore south of the Haven we observed a Heron, some Curlew, Ringed-Plover, Dunlin in flocks, the black underparts of their summer plumage being very conspicuous in flight, Redshank, and four Reeves ; Lapwings were also plentiful. In Theddlethorpe Marsh ten to twenty pair of Redshank were nesting, and probably the same number of Lapwing—these two have increased since the passing of the Bird Protection Acts, and the former in a very marked degree.

Both species are very noisy, and resented the intrusion on their nesting quarters, dashing to and fro and winnowing the air with rapid beats of their wings, and uttering all the time tremulous cries of disapproval. The Redshanks fly in a curious fashion, suspending their wings at right angles to the body, that is, pointing directly downwards. Both species had young on the ground, hence this distressful clamour. We found a somewhat elevated nest of the Lapwing made of dead bents, with four eggs placed point to point. We were much pleased to see two pair of the Common Sandpiper, and from their actions evidently nesting birds. On 16th June 1890, the Rev. C. W. Whistler, formerly of Theddlethorpe, an excellent naturalist, and one of the first members of our Society, was fortunate in discovering two nests of this species in the same locality, and this was the first record of the Common Sandpiper nesting anywhere in the eastern counties south of the Humber (Zool., 1893, p. 304). The present occurrence, therefore, in the same district in the summer of this year is particularly interesting. Other birds seen were Kestrels, Carrion Crow, Mistletoe Thrushes, both old and young being numerous on the commons and warrens; Blackbirds in numbers in the thickets of sallow thorn; Common and Red-legged Partridge, the latter predominating; Meadow Pipits, Linnets, Corn-Buntings, Reed-Buntings, Whinchat, Whitethroat, Coal-Tit and young. Feathers of Mallard were found on the Haven bank; an egg of the Cuckoo in Linnet's nest; and dropped eggs of the Meadow Pipit and Mistletoe Thrush.

We will add the following note:—During the last week (9th June) a very large bird of prey, like a gigantic Sparrow Hawk, has on two occasions crossed the garden of Great Cotes, the last being on the morning of 9th June, when in company with the Revs. E. Adrian Woodruffe-Peacock and Alfred Thornley. Its large size, short rounded wings, long tail, and rapid and steady flight, were all suggestive of the female Goshawk, a very, very, rare bird now to see in England. In the last forty years we have only seen it alive on two occasions in the Humber district.

The Rev. A. Thornley, M.A., F.L.S., F.E.S., reports the Entomology as follows:—Owing to the kindness of our lost friend Mr. John Cordeaux, I was able, with the assistance of the Rev. E. A. Woodruffe-Peacock, to enjoy a ramble on the preceding day in the Freshney Bog at Great Cotes. Unfortunately, the sun became obscured, the temperature ran down, and a most promising day was rather spoilt. Nevertheless, three or four hours' hard work furnished a lot of material which

has produced an interesting list. We took 67 species of Coleoptera, 31 Diptera. Lepidoptera were scarce, but *Lomaspilis marginata* and *Hadena thalassina* turned up, with numerous burnet-larvæ; I had one, which emerged as *Zygæna loniceræ*. In the group Neuroptera, *Panorpa vulgaris* (Scorpion Fly) and the red dragonfly, *Pyrrhosoma minium*, with its pretty blue cousin, *Agrion puella*, was abundant. In the Hymenoptera, *Andrena chrysosceles* ♀, occurred at flowers of wild Chervil. *Acompus rufipes*, a rather local bug, was abundant amongst the rushes. *Miris calcaratus*, *M. lævigatus* and *Megaloceræa erratica* occurred commonly. I subjoin a list of the less common Coleoptera and Diptera:—

Corymbites tesselatus. Common.
Subcoccinella 24-punctata.
Phyllobius alneti. A grey variety.
Ragonycha testacea. Common.
Galeruca lineola. Common.
Galeruca tenella. Common.
Campylus linearis.
Limnobaris t-album.
Crepidodera modeeri.
Phyllobius viridicollis.
Hydrothassa aucta.
Gymnetron labilis. Common.
Stenus flavipes. Common.
Dasytes æratus (Steph.).
Telephorus figuratus. Several.
Orchestes saliceti.
Hypera suspiciosa.
Cercus bipustulatus.
Ceuthorrhynchus cochleariæ.

Amongst the Diptera, the best flies were a Syrphid, *Tropidia milesiiformis*, which was common, and *Syrphus lunulatus*.

Saltfleetby.

The fall of temperature recorded on the previous day continued, and the drive from Louth to Saltfleetby was in the teeth of a strong N.E. wind. Insects were naturally scarce. But hard work amongst rubbish on the salt marsh revealed several species I had found there a few years ago. *Pogonus chalceus*, common, especially under the cakes of dried mud. *Bembidium concinnum* was common under tidal rubbish on the banks of the river, but chiefly in one spot. *Cillenus*, common in 1896, I failed to find. *Homalota vestita* was everywhere in damp places. A dead rabbit yielded some score of *Saprinus nitidulus*, *Hister cadaverinus*, *Choleva chrysomeloides*, *C. grandicollis*, *C. tristis*, with *Necrophorus humator* and *Creophilus maxillosus*. A single specimen of *Dendrophilus punctatus* and a pair of *Corynetes cæruleus* in an old bone, were nice finds. The following beetles were also found:—*Harpalus tardus*, *Bledius spectabilis*, *Ceuthorrhynchus asperifoliarum*, *Dichirotrichus pubescens*, *Dyschirius æneus*, *D. globosus*, *Leistus ferrugineus*, *Bembidium minimum* and *B. varium*, with many abundant seaside species. It was hoped that some good work would have been done amongst the

Saldidæ, a family of leaping bugs, generally found in salt marshes, but the specimens obtained were all in the nymphal condition, and so difficult to identify. I have taken some three or four species in this locality about the end of June.

At North Somercotes three new and unrecorded Spiders turned up. *Clubiona neglecta* Cambr.; this is rare anywhere. *Heliophanus flavipes* C.L.Koch, locally rare. Also *Drassodes cupreus* Bl., with a number of other species, more or less common to other parts of the county, which have gone into the Register for future publication in 'The Naturalist.'

As the party had made a very early start from Louth, shortly after three o'clock they joined forces at the New Inn, Saltfleetby, where the late Mr. John Cordeaux hospitably provided an excellent high tea for the Union at his own expense, as he ever did when it met in his neighbourhood. Mr. E. Kyme Cordeaux, J.P., was in the chair. After the usual short accounts of the day's observations had been given, the Rev. W. Fowler proposed a very cordial vote of thanks to Mr. Cordeaux. Mr. Burton seconded, remarking that not only had they enjoyed Mr. Cordeaux's kind hospitality, but they had also had the advantage of his presence and of his intimate knowledge of the bird life of the neighbourhood. If a new name were required for the district, he would suggest Cordeaux-land as an appropriate appellation.

Mr. Cordeaux, on rising to thank his visitors for their presence and good wishes, said he had known the neighbourhood ever since he was a lad, for it was there he had first imbibed his love for Natural History and Ornithology.

NOTE—ARACHNIDA.

Harvestmen and Spiders near Grantham.—Miss S. C. Stow, of Court Leys, Brandon, Grantham, Nat. Hist. Div. 13, sent me the following, taken there in 1899:—

PHALANGIDEA.

Liobunus rotundus Latr.
Phalangium cornutum Linn.
Phalangium saxatile C. L. Koch.

ARANEIDEA.

Zilla atrica C. L. Koch.
Meta segmentata C. L. Koch.
Philodromus dispar Walck.
Theridion varians Hahn.
Dictyna uncinata Westr.
Theridion tepidariorum C. L. Koch.
Steatoda bipunctata Linn.
Phyllonethis lineata C. L. Koch.
Bathyphantes dorsalis Wider.
Gongylidium dentatum Wider.

—E. ADRIAN WOODRUFFE-PEACOCK, Cadney, Brigg, 16th February 1900.

NOTE—LEPIDOPTERA.

Death's Head and Hummingbird Hawkmoths at Doncaster.—I had a pupa of *Acherontia atropos* brought to me this morning to identify; it was found in a garden on the Doncaster Carr.

I may as well also mention that at Doncaster I have seen the Hummingbird Hawkmoth (*Macroglossa stellatarum*). I could at times count two or three poised above the flowers of the Scarlet Geraniums and other flowers, or passing from one truss of bloom to another, while I was staying at 10, Avenue Road, in the September race week.—A. PATERSON, 45, Cemetery Road, Doncaster, 5th October 1899.

NOTE—HYMENOPTERA.

Hornet at Beverley.—On 26th September last a specimen of the Hornet (*Vespa crabro*) was taken inside my house by my sister, and I have secured it for my collection. I believe this insect to be of uncommon occurrence in East Yorkshire. It is a question how a solitary specimen occurred here, where the species has never been known to breed.—JAMES R. LOWTHER, Crane Hill, Beverley, 3rd November 1899.

[This record is one of great value and interest. The only previous authenticated occurrence for Yorkshire that I am aware of is that at Bishophill, York, some fifty years ago, as recorded in my List of Yorkshire Hymenoptera (Trans. Yorks. Nat. Union, Part 2, for 1878, pp. 49-50). Mr. Lowther has allowed me to see his specimen, which is certainly *Vespa crabro*.—W. D. R.]

NOTE—ORNITHOLOGY.

Rough-legged Buzzard near Knaresborough.—On the 18th January this year I was on the road betwixt Nidd Hall and Knaresborough. Whilst standing under a tree on the roadside I observed a large bird some distance away. I noticed it was coming towards me, and kept close behind the tree. As it got nearer I saw it was a Rough-legged Buzzard (*Archibuteo lagopus*). As it was passing a Wood Pigeon (*Columba palumbus*) suddenly flew out of a tree close by and was instantly swooped down upon by the Buzzard. I should not be more than fifteen yards off when the Pigeon was struck. It was carried over the next fence, and I quietly followed, getting within ten yards, anxious to watch the plucking and devouring process. I was seen, however, and Mrs. Buzzard (I saw it was a female, for it was larger and darker than the male) flew off, leaving nothing but a few feathers, some of which I carried home in memory of the event.—K. MCLEAN, Harrogate, 24th February 1900.

BOOK NOTICES.

A little cloth-bound Shilling volume emanating from the office of our spirited contemporary 'Knowledge' is one on '**The Mycetozoa | and some Questions which they | suggest** | By | the Right Honourable | **Sir Edward Fry,** D.C.L., LL.D., F.R.S., F.L.S., | **and** | **Agnes Fry.** | — | . . | . . | — | London: | "Knowledge" Office, . . | 1899. The little book runs to 82 pages, and includes numerous illustrations.

Although dated '1896' we have this month received from the Leigh-Browne Trust a small book on '**Biological Experimentation | Its Functions and Limits** | including Answers to Nine Questions | submitted from the | Leigh-Browne Trust | By | Sir **Benjamin Ward Richardson** | M.D., F.R.S. | London | George Bell & Sons | York Street, Covent Garden | 1896' (in cloth, 170 pages). In this little work are successively discussed indispensable experiment, the discovery of Anæsthesia, lines of painless research, the causes and treatment of disease, the natural method of preventing disease, erroneous methods of research, instruction by experiment under legal enactment, and a school of preventive medicine.

A CRITICAL CATALOGUE OF LINCOLNSHIRE PLANTS: FROM ALL KNOWN SOURCES.

Rev. EDWARD ADRIAN WOODRUFFE-PEACOCK, L.Th., F.L.S., F.G.S.,
Vicar of Cadney; Organising and Botanical Secretary, Lincolnshire Naturalists' Union.

FOURTEENTH PAPER.

See 'The Naturalist,' 1894-1897, for other papers of this series.

This paper once again brings the floral work in the county of Lincoln up to date as far as it is at present known. N. Lincs. 54 contains Divisions 1-12, S. Lincs. 53 Divisions 13-18. Unless another herbarium is named, or there is a note that no specimen is known, there is a specimen or selection in the Lincolnshire County Herbarium. Again I have to thank Messrs. Arthur Bennett, F. A. Lees, and E. G. Baker for much invaluable critical help in naming species and varieties, and my many fellow-workers for their untiring efforts in sending in notes and specimens, especially Miss S. C. Stow and the Revs. W. Fowler and W. W. Mason. As this latter gentleman and I are hoping to go to press with a Flora soon, this series in 'The Naturalist' is likely to be suspended for some time. I much regret that the result of three years' hard work on the part of many workers in this large county should be so unsatisfactory—a record of so few native species, varieties, and hybrids, and so many doubtfuls and aliens. It clearly proves that the early labourers in the field of topographical botany worked right well, and that there is little hope that many more native species remain to be discovered, though much detail work requires doing.

I ought to add here that our rarer sand and peaty sand common plants are the most unsatisfactory natives we have. It is often almost impossible to prove that they are truly native. They suffer so much from gales of wind burying them or bodily blowing away the hills on which they grow. Once between Ashby and Scunthorpe, but near the latter place, on a wind-gathered sand common, which was never fully grassed over in my memory, I saw a whirlwind through its whole progress. One lovely August day, a little after noon, without a warning sign, a perpendicular column of sand, I should judge two hundred feet high from the range of hills beyond, rose from the common. After gyrating round within a space of three to four hundred yards it sank to the ground more slowly than it rose, forming a perfect sand storm to the east, in the direction of the Cliff. The dunes where this occurred of late years have been

bodily removed to work the Middle Lias Ironstone lying below. I once visited them when the pit cliffs showed the old contour lines of former surfaces which had been buried one after another. Sometimes a little marshy spot had been buried and converted into a hill by a single storm apparently. At other times a wide and deep peat bog had only been covered by such a weight of sand that the compressible middle had sunk below the water level again to become a peat bog, and once more be buried. In one place this process had been repeated five times, the basin ever diminishing in size. In the last three cases the changes had been rapid, for the humus beds and sand were all shallow. The highest ground, though it was a fairly flat surface which was being removed, was almost in what must have been the centre of the section of the original bog. It was not far from this spot that the Rev. W. Fowler gathered *Lycopodium alpinum* Linn., now in the Brit. Mus. herbarium. It is needless to say it has not been seen for years; how it survived as long as it did is wonderful. What chance can rare dry sand-loving species of these hills, or their damp, peaty, sand-loving congeners of the valleys, have under such circumstances?

This rapid change of surface, too, is not alone confined to sand dunes; on entirely enclosed arable land wind-drifts frequently work wholesale destruction. Between Blyton and Scotton Common, as late as May 1898, my brother Max and I found sand drifted from the newly-sown fields five feet deep, blocking the road for some distance about half a mile from Laughton Wood. A countryman who was busily engaged in removing it to such an extent that a cart might pass, laconically remarked as I expressed wonder, 'I've known worser windles.' I have, too, for it is my experience that no soil drifts so much as dry arable peat during spring cultivation. The seed and seed-bed have been known to leave a lordship together; and mangel-wurzel have been scattered over a wide area.

A single storm spread *Thlaspi arvense* Linn., which had been introduced with wheat seed, all over the carr-land on one side of this parish, where it flourishes still.

The seaside dunes, which lie on a very flat shore in N. Lincs. 54, consist for the most part of much worn sand derived from frost-shattered or shore-broken white or grey flints, or the impure quartz detritus of more distant rocks from which the less indestructible parts have perished. The flints and other stones are obtained from the slow shore-wave denudation of the boulder clay, on which for the most part the sandhills

directly lie, much more rarely with a thin bed of alluvium between them. If the weather is dry a slight breeze alters the form of the hills, and a heavy gale can bodily shift them. To such an extent is this perpetual motion the case on the coast, that *Glaucium flavum* Crantz is quite rare; I fear almost, if not perfectly, extinct. I only know one collection, besides the County Herbarium, where full-grown specimens in flower and seed are preserved; and they were all taken on the Lincs. shore by one hand more than thirty years ago. *Lathyrus maritimus* Bigel is another case in point; it is a shingly beach species. If it has not gone for ever, it is certainly over fifty years since it was seen on the old spot at Ingoldmells, and nearer a hundred I should judge from evidence I possess. Though there is almost absolute proof of its former growth with us, generations of eager botanists have sought it in vain, and I do not know of a single Lincs. specimen anywhere. Many long miles of coast walking—they are long and thirsty in August—have not discovered a spot where it is likely to be found, but as I have not yet personally examined every locality I cannot abandon all hope. *Silene maritima* With., whose boulder habitat has been buried by sands east of Cleethorpes in my memory is a good example; and *Senecio viscosus* Linn., met with for two seasons in succession, is another typical instance. Where the latter can be certainly located next season I cannot say, though I have received it fresh from the coast from different friends, and obtained the most exact topographical notes.

It may easily be true that *Weingærtneria canescens* Bernh., recorded in this paper as a casual colonist from the Norfolk coast, is a native barely able to hold its own against adverse circumstances. The rarity, however, of certain plants, which are or may prove to be native on the Lincs. coast, will not explain the presence of a species like *Euphorbia portlandica* Linn., which is a W. and not E. type, and must therefore be classed as an alien, or of a foreign species like *Iris spuria* Linn., so well established just inland. They are problems which to my present knowledge appear insoluble.

Alisma ranunculoides Linn. Native. N. Div. 1. Haxey, 22nd June 1894; Rev. W. Fowler. 'A curious floating state from deep water.'—F. A. L.

Alopecurus fulvus Sm. Native. In 'The Naturalist,' 1898, p. 336, I recorded a species taken at Haxey Turbary, N. Div. 1, by Rev. A. Thornley, as *A. fulvus* Sm. Mr. F. A. Lees, doubting the identification, asked me to send

it to Mr. Arthur Bennett. He transmitted it to Prof. Eduard Hackel, of St. Poelten, Austria. This great authority simply says *A. fulvus* Sm., and makes no other remark on it beyond the name. I also sent it to the Brit. Mus.; the authorities there are of the same opinion. The Lincolnshire plant is certainly not exactly like Smith's type, but its size and extreme glaucousness may be accounted for by the great heat and want of moisture, growing on dry peaty sand, high above summer water mark.

Alyssum calycinum Linn. Alien (Europe and the East) with foreign seeds. N. and S. Divs. 2.3.7-11.13-15.

Alyssum incanum Linn. Alien (Europe; Siberia). N. and S. Divs. 7.8.13.14.

Anacyclus radiatus Loisel. Alien (Mediterranean countries). S. Div. 13. Midland Railway Station, Lincoln, 1897; Miss S. C. Stow (F. A. L.).

Anagallis pallida Hooker. Alien (Europe) with foreign seed. The type is not rare; but mauve flowers, with a dark purple centre, is the commoner colour form. N. and S. Divs. 2.3.7.10.16.

Anchusa sempervirens Linn. Alien (Europe) garden escape. N. Divs. 10.11.

Barbarea intermedia Boreau. Alien (Habitat?). N. Divs. 3.7.8.

Briza maxima Linn. Alien (Mediterranean countries; Northern Africa) garden escape. N. Div. 4. Laceby, 1898; A. Smith.

Bromus racemosus Linn. Alien (Europe). N. Div. 8. Louth, 1896; F. A. Lees. 'In an oatfield.' S. Div. 13. Court Leys, 1897; Miss S. C. Stow.

Bromus rigidus Roth. Alien (Europe; Mediterranean countries; and Caucasus). N. Div. 4. Grimsby, 1897; E. V. Woods (F. A. L.).

Bromus squarrosus Linn. Alien (Southern Europe; the East; Northern Asia). N. Div. 4. Grimsby, 1897; E. V. Woods (F. A. L.).

Bromus tectorum Linn. Alien (Europe; the East; Northern Asia). N. Div. 4. Grimsby, 1897; E. V. Woods.

Carduus crispus × ***nutans*** (*C. Newbouldi* H. C. Watson). Native. N. Div. 10. Martin; Rev. F. S. Alston, August 1897 (F. A. L.).

Carex elongata L.† Native. N. Div. 5. Laughton Low Warren and Scotton Common, 1881-1898; Fowler and Peacock (A. B.).

Carex pulicaris Linn. Native. N. Divs. 2.4.7.12. After fruitless hunting eight seasons for type specimens for the County Herbarium, I took it at Aylesby bog this season. N. Div. 4 (W. F.).

Centaurea aurea Ait. Alien (Southern Europe). N. Div. 4. Grimsby, 1897-1899; E. V. Woods and A. Smith. N. Div. 7. Lincoln, West Parade Brickyard, 14th July 1899; H. M. W. Hinchliff (both F. A. L.).

Centaurea Calcitrapa Linn. Alien (Europe, Northern Africa, and temperate Asia). N. Div. 10. Low Toynton, 1890; Rev. J. W. Bayldon. S. Div. 13. Fossdyke Bank, Lincoln, 17th June 1898; J. S. Sneath.

Centaurea intybaca Lam. Alien (France and Spain). N. Div. 6. Lincoln, West Parade Brickyard, 14th July 1899; H. M. W. Hinchliff.

Chenopodium vulvaria Linn. Alien? (Europe and Northern Asia). S. Div. 13. Fossdyke Bank Shipyard, 4th August 1898; Sneath and Peacock. The County Herbarium specimen has still a most fetid odour, 31st October 1899.

Cnicus lanceolatus × ***acaulis***. Native. S. Div. 16. Bourne to Edenham, 1896; Stow and Peacock. Where the two species were growing side by side (F. A. L.).

Coriandrum sativum Linn. Alien (Southern Europe, the East). N. and S. Divs. 8.14.16.

Coronopus didymus Sm. Alien (cosmopolitan). N. Div. 3. Ferriby Sluice, 1878; Rev. W. Fowler in Herb. Brit. Mus. N. Div. 4. Scartho, 1866; Rev. W. H. Daubney.

Coronopus pinnatifidus Dulac. Alien (cosmopolitan). S. Div. 13. Fossdyke, Lincoln, 1898; Sneath and Peacock (F. A. L.).

Crepis setosa Hall. fil. Alien (Europe; Asia Minor). N. Div. 4. Grimsby, 1899; G. Parker.

Echium italicum Linn. Alien (Europe; Mediterranean countries). N. Div. 6. Lincoln, West Parade Brick Pits, 14th July 1899; H. M. W. Hinchliff.

Echium plantagineum Linn. Alien (Mediterranean countries). N. Div. 4. Grimsby, 1897; E. V. Woods. S. Div. 13. Lincoln, 1898; Sneath and Peacock.

Epilobium roseum Schreb. Native. S. Div. 16. Bourne, 1896; Stow and Peacock (F. A. L.). Specimen in Mr. Arthur Bennett's Herb.

Erophila præcox DC. Native. N. Div. 7. Walesby, 1878; F. A. Lees in Herb. Brit. Mus. S. Div. 15. Great Ponton, April 1898; H. Fisher in Herb. Notts. Mus. 'On walls with intermediates; the true *brachycarpa* is rare.'—H. F.

Eruca sativa Mill. Alien (Mediterranean countries; Western Asia). N. Div. 4. Grimsby, 1899; G. Parker. N. Div. 8. Louth Flour Mill, 1896; J. Larder (F. A. L.).

Erysimum perfoliatum Crantz. Alien (Europe; the East). N. and S. Divs. 3.7.13.

Euphorbia portlandica Linn. Alien? N. Div. 9. Skegness, 1897. Mr. F. A. Lees saw and obtained a specimen for me from a lady in a railway carriage returning from this resort. Dr. T. Howard confirmed the fact later, saying he had seen the species there some years before. This *seems* to be the first record for the East Coast, or, in other words, it is a casual alien with us, I suppose, sown by some lover of our native plants, who was too modest to leave a record of the fact. I have as yet failed to discover this species growing myself, and so can say nothing about its surroundings. A seed may have dropped from the crop of a bird of passage killed by a Peregrine (*Falco peregrinus* Tunstall)—I have known such cases. But my experience is that birds of long flight have generally empty crops; and I know no bird which feeds on the seeds of *E. portlandica,* never having been on the west coast at the right time of year. Can any brother naturalist make a suggestion from his own personal observation?

Galium palustre Linn. var. ***elongatum*** Presl. This is the common var. at Ingoldmells, N. Div. 11, and elsewhere in the marsh where there are deep drains, in N. and S. Divs. 11.12.17. In the parish named I found some specimens nearly five feet long growing amongst *Phragmites.*

Glaucium phœniceum Crantz. Alien (Europe; Mediterranean countries). N. Div. 6. Lincoln, West Parade Brick Pits, 14th July 1899; H. M. Hinchliff.

Gypsophila porrigens Boiss. Alien (Asia Minor; Persia). N. Div. 6. Lincoln, West Parade Brick Pits, 1899; H. M. Hinchliff.

Hyssopus officinalis Linn. Alien (Europe and temperate Asia) garden escape. N. Div. 1. Epworth, 18th September 1899; C. C. Bell (F. A. L.).

Iris fœtidissima Linn. Alien? N. and S. Divs. 3.14.16. Herb. Brit. Mus. Perhaps the record for Div. 14 is not this species; I have not seen a specimen.

Iris spuria Linn. Alien (Europe; and Wood's 'Tourists' Flora' says Elne, Narbonne, Metz). N. Div. 11. Huttoft, 1894-1899; F. M. Burton. I believe it also grows on a bank in Div. 12, at Friskney, July 1879, Dr. Burgess; but I have seen no specimen. *I. spuria* certainly grows in several spots at Huttoft. I may be wrong in thinking this is a European species at all, as Linn., Bertol., Pall., and Reichb. have each named a separate species *spuria*, and there is much confusion. The presence of this species growing *wild* in Lincolnshire is as difficult to account for as *L. portlandica* above, for it is never grown in gardens, and as far as I can learn has never been used medicinally. It can hardly be bird sown. I have no proof that even the *Anatidæ* take *Iris* seeds; but it may have been planted by a long-forgotten naturaliser.

Isatis tinctoria Linn. Alien (Europe; the East). My friend the late J. Cordeaux told me that two plants of this species came up and flowered at Great Cotes (N. Div. 4) some years ago, after the removal of some earth in making a footpath. It was cultivated near Grimsby and Boston from very early times. 'The 'wads,' or outlying farmsteads of Great Cotes parish, are said to take their name from the Woad, once cultivated in patches around them.'—J. Cordeaux.

Lagurus ovatus Linn. Alien (Southern Europe; Northern Africa). N. Div. 4. Laceby, August 1899; A. Smith. N. Div. 11. Skegness, 1870; Rev. W. W. Mason. In both cases garden escapes or outcasts.

Lamium maculatum Linn. Alien (Europe; the East). Garden escapes or outcasts. N. and S. Divs. 2.7.10.11.15.

Lathyrus Cicera Linn. (= ***erythrinus*** Presl.). Alien (Europe; the East). N. Div. 6. Lincoln, West Parade Brick Pits, 1899; H. M. W. Hinchliff. S. Div. 13. Lincoln, by Fossdyke, 1898; Sneath and Peacock (F. A. L.).

Leucojum æstivum Linn. Planted alien? (Europe; the East). N. Div. 8. Calcethorpe Wood, May 1897; Miss Lewin.

Lychnis dioica* × *flos-cuculi. Native. N. Div. 1. Sam Hudson, 1895 (F. A. L.).

Lycopus orientalis Linn. Alien (Southern Europe; the East). N. Div. 4. Great Grimsby, September 1899; G. Parker. S. Div. 13. Lincoln, 1896; Sneath and Peacock.

Matthiola tristis R.Br. Alien (Mediterranean countries). N. Div. 4. Grimsby, 1899; G. Parker.

Medicago falcata Linn. Alien (Northern and temperate Old World). N. Div. 4. Grimsby, 1897; L. V. Woods and A. Smith (F. A. L.).

Medicago orbicularis All. Alien (Mediterranean countries; Abyssinia). S. Div. 13. Fossdyke, July 1898; Lees and Sneath.

Medicago sylvestris Fr. Alien (Sweden; England). N. Div. 4. Grimsby, 1897-99; Wood, Smith and Parker. S. Div. 13. Canwick, 1896; J. S. Sneath. Certainly alien in N., and though it looks native enough on river gravel in S., I fear me it must be classed as alien too; foreign waifs are so common round Lincoln, and have been for a hundred years.

Myrrhis odorata Scop. Alien (Southern Europe; Caucasus countries). N. and S. Divs. 2.8.15.

Odontospermum aquaticum Sch. Alien (Mediterranean countries). N. Div. 6. Lincoln, 1899; H. Hinchliff.

Ornithopus ebracteatus Brot. Alien (Western Europe; Mediterranean countries). N. Div. 4. Great Grimsby, 1897; E. V. Woods (F. A. L.).

Orobanche. A specimen of a native species of this genus, which has not yet been determined, was taken in Div. 8 by Miss Lewin, 1898. If I do not receive the specific name in time for this paper, I will publish it later in 'The Naturalist,' for it is undoubtedly new to this county if not to Britain. It is in Austria at present.

Orobanche elatior Sutton. Native. N. and S. Divs. 6(2).13.16.

Phragmites repens Mey. Native. N. Div. 11. Ingoldmells, August and September 1899; Peacock. On pure sea sand, but with its main root in the silt or boulder clay below. This variety never seems to flower or root properly in the sand, where *Lotus corniculatus* flourishes luxuriantly with the aid of the lime from fractured sea shells, and grows innumerable bacteria warts. Some of the *P. repens* runners were forty feet long, by careful measurement, one rather over, many between twenty and thirty feet.

Plantago arenaria Waldst. et Kib. Alien (Europe; Asia Minor). N. Div. 6. Lincoln, 1899; H. M. W. Hinchliff.

Polycarpon tetraphyllum Linn. Alien (cosmopolitan). N. Div. 4. Great Grimsby, Sept. 1899; G. Parker (F. A. L.).

Polypogon monspeliensis Desf. Alien (tropical and temperate cosmopolitan). N. Div. 6. Grimsby, August 1898; A. Smith.

Portulaca oleracea Linn. Alien (warm countries). N. Div. 7. South Kelsey, 1887; Rev. H. C. Brewster (F. A. L.).

Pyrus aria Ehrh. Planted alien (Europe; Northern Asia). N. and S. Divs. 3.8.15.

Ranunculus repens forma ***lingulatus*** F. A. Lees.† Native. Div. 4. Bradley Wood, May 1897; B. Crow. See 'The Naturalist,' 1897, p. 172, and most curious specimens in County Herbarium.

Rumex pulcher Linn. Native. N. and S. Divs. 3.13.17. No known specimen; but H. C. Watson's MS. notes for the first ed. 'Top. Bot.' in Brit. Mus. give my second locality.

Salicornia herbacea Linn. var. ***stricta*** Dum. Native. N. Div. 12. Friskney, 12th Sept. 1899; Miss Lane-Claypon. 'I believe that your specimen belongs to this species, but this name cannot stand either as a species or variety,' Mr. Arthur Bennett says. But for the time being it will do to distinguish a clearly marked type of *S. herbacea*. Specimen in Mr. Arthur Bennett's Herb.

VAR. ***procumbens*** Moq. Native. N. Div. 11. Ingoldmells to Gibraltar Point, 1899; Peacock. S. Div. 17. Sandholme Farm creek, Frampton, 1897; Lane-Claypon and Peacock (A. B.).

Salix aquatica Sm. Native. N. and S. Divs. 12.14.

Salix purpurea × ***viminalis*** (= ***rubra*** Huds.). Native. N. and S. Divs. 4.17.

Salix triandra × ***alba*** (= ***undulata*** Ehrh.). Native. N. Div. 6. Great Cotes, 1897; Cordeaux and Peacock.

Salvia controversa Tenore. Alien (Mediterranean countries). N. Div. 6. Grimsby, 1899; G. Parker (E. G. B.).

Salvia officinalis Linn. Alien (Mediterranean countries). N. Div. 4. Grimsby, 1897; Woods and Smith.

Scorpiurus vermiculata Linn. Alien (Mediterranean countries). N. Div. 6. Lincoln, 1899; H. M. W. Hinchliff.

Sideritis montana Linn. Alien (Mediterranean countries; the East). S. Div. 13. Fossdyke, Lincoln, 1898; J. S. Sneath (F. A. L.).

Silene conica Linn. Alien (Europe; the East). S. Div. 13. Fossdyke, Lincoln, 15th June 1897; G. A. Grierson.

Tolpis barbata Gærtn. Alien (Mediterranean countries). N. Div. 6. Lincoln, 1899; H. M. W. Hinchliff.

Trifolium filiforme L. Native. N. and S. Divs. 8.15. Often recorded in local lists, but we have had no satisfactory evidence till lately (F. A. L.).

Trigonella cærulea Ser. Alien (Western Europe and Caucasus). N. and S. Divs. 6.13.

Trigonella purpurascens Lam. Native? S. Div. 13. Fulbeck, on the heath land, 2nd July 1897; Rev. R. W. Goodall. No specimen seen. Sci. Goss., 1898, p. 69.

Triticum triunciale Rasp. Alien (Europe). N. Div. 6. Lincoln, 14th July 1899; H. M. W. Hinchliff. This is the parent species of all our wheats of cultivation.

Veronica grandiflora Bab. Native. S. Div. 15. Great Ponton, April 1898; H. Fisher. Specimen in Notts. Museum.

Veronica humifusa Dickson. Native. N. Div. 8. Kenwick, 1898; Miss Lewin.

Veronica montana Linn. Native. N. Divs. 2.7.8.11.

Vicia narbonensis Linn. Alien (Mediterranean countries and the East). S. Div. 13. Fossdyke, Lincoln, 1896-98; Lees, Sneath, and Peacock.

Vicia pyrenaica Pourr. Alien (Pyrenean mountains). S. Div. 13. Fossdyke, Lincoln, 1896; Lees and Sneath. In Mr. F. A. Lees' Herb.

Vicia serratifolia Jacq. Alien (Habitat?). N. Div. 2. Broughton Wood, 3rd June 1895; Charles Waterfall, and in his Herb. This is a lovely variety of *V. narbonensis* Linn. above, and was no doubt sown as pheasant food.

Weingærtneria canescens Bernh. Colonist from Norfs. shore? N. Div. 11. Gibraltar Point, 1878; F. A. Lees, and in his Herb. I have not seen this species growing yet, and at present have no idea where to look for it. Mr. F. A. Lees has promised to join us in a search next season.

Since the above records were in print the following specimens and notes have come to hand :—

Brassica adpressa Boiss. Alien. S. 13. Court Leys, Nov. 1899; Miss S. C. Stow. From a 'seed-field.'

Daucus. Two specimens have come to be named from the same 'seed-field' at Court Leys. They may be nothing more than off-type forms of *D. Carota* Linn., for Mr. F. A. Lees and I have equally failed in running them down in any books we possess. I will send them to London, and 'The Naturalist' shall have a short note later. 'Seeds,' as we locally call red and white clover and rye-grass mixtures, are now grown in all parts of the temperate world, and as there is a constant exchange between the centres of growth, aliens from one or two continents may be found in one patch of 'grass.'

Iris spuria Linn. My friend Mr. F. A. Lees has pointed out to me that mixed packets of the seeds of this and other species of *Iris* can be purchased from Barr and other seed-merchants, from 3d. to 6d. a packet, for 'naturalising in wild gardens, woodlands, etc.' This does not settle the problem quite. I have only seen one type *Iris fœtidissima* from this county, Div. 16. in Herb. Brit. Mus., and *Iris spuria* from Huttoft. We may have a case of *Selinum carvifolia* Linn. over again, collected specimens having been wrongly named *fœtidissima*, by authority, which I knew were nothing of the kind. The painting in Dr. Burgess' collection is not to be relied on, he tells Mr. F. M. Burton. So nothing remains but to wait till next season and bring a typical series of specimens from all our known localities together.

NOTES—ORNITHOLOGY.

Birds Laying in One Nest.—On the 5th July 1898, while going over a meadow for the Notts. County Council at Appleby, Nat. Hist. Div. 2, North Lincs., we put a Partridge (*Perdix perdix*) off her nest. She was sitting on two Pheasant's eggs and three of the Red-legged Partridge (*Caccabis rufa* L.) as well as her own, which numbered ten if I remember rightly. I have known two, but never three, birds to lay in one nest before. —E. Adrian Woodruffe-Peacock, Cadney, 8th February 1900.

Geese and Swans and Severe Weather near Horncastle. During the severe weather in the second and third weeks of February we had various unusual wild fowls about in Mid Lincolnshire. On 5th February a large flock of Wild Geese, the 'Grey Lag' (*Anser cinereus*), passed over me when rabbiting, apparently steering for the Humber. On the 13th a flock of Wild Swans (*Cygnus musicus*) passed over the marsh country between here and Burgh.—J. Conway Walter, Langton Rectory, Horncastle, 17th February 1900.

NOTES—BOTANY.

***Iris spuria*, British?**—There are 49 distinct species of *Iris* inhabit Europe: two only given in our Manuals as British. Nmyan in his *Conspectus* arranges the Irids according to their affinities in three sections; the second of which (*Euirides*) he subdivides into Barbata and Imberbes. Under the sword-leaved Imberbes five only are included, both the British species and the others in this order.

36. *Iris Pseudacorus* Linn. Britain, Portugal, Spain, France, Belgium, Holland, Denmark.

37. *Iris fœtidissima* Linn. England, Ireland, Portugal, Spain, France, Italy = *I. spuria* Bertolini.

38. *Iris spuria* Linn. Castile, Valencia, Southern France (Narbonne), and West France, Germany Western, Danish isles of Saltholm, etc., Austria-Hungary.

39. *Iris Guldenstædtiana* Lep. Southern Russia, Roumania. Sub. sp. *spuria* Reichenbach. In Hungary, Transylvania, Moldavia.

40. *Iris Monnieri* DC. Crete. (Sieb. sec. Baker.)

Then follow the linear-leaved Imberbes with which we are not concerned.

But, from above we see (1) that *fœtidissima* is the *spuria* of Bertolini; (2) that ranking next to it is true Linnean *spuria*; and (3) that these two are very much alike, very near in characters, have been confused by great botanists; and (4) that from the latitudinal distribution *spuria* L. is quite likely to be English. The plant called *fœtidissima* hitherto may be divisible into two, referable to both *fœtidissima* and *spuria*. If the Huttoft plant has not been the product of sown mixed seed from a nurseryman, it is *more likely* to be 'native' in the wet spots where it grows along with *Pseudacorus* than if it were the dry-soil bushy-place true-'*fœtidissima*.' This is never found with *Pseudacorus* in S.W. Ireland, Dorset, etc.

And which of the spurias is Mr. Fowler's Corby Wood plant, that added to the Linc. Flora by him? Probably the true Linnean *fœtidissima*. But before this can be settled, in the coming season, *plentiful material* must be got and then submitted to the South Kensington authorities. Reviewing the whole matter so far as we know yet, this may be another case of *Selinum Carvifolia*, found to be native otherwhere in England after the Rev. W. Fowler had detected it at Broughton.

There is no more to be said, I think. All suppositions and arguments as to the out-of-the-way spot on the Lincoln littoral where it grows intermingled with the yellow flag, are but special pleadings; to which it may be controversially replied that Barr, of Daffodil fame, the seedsman of Covent Garden, teste his 1900 Seed Catalogue, p. 58, sells for a few pence packets of mixed seed of 'lævigata (a Japanese kind) sibirica, graminea, spuria, spuria-major [whatever that may be], pseudacorus,' and others. None of the three first grow at Huttoft! No 'fœtidissima' at all is offered for sale! All rather goes to make this a matter on which we must suspend judgment, whilst keeping our minds alert to seize any forthcoming facts which may add another floral gem to the crown of the queen of English counties.—F. Arnold Lees, Leeds, 20th February 1900.

I should not be surprised, from its continental distribution, if *Iris spuria* were to turn up in Devonshire or the Channel Islands. It differs from *I. fœtidissima* as follows:—(1) The leaves have not the strong unpleasant scent from which the latter takes its name; (2) the blade of the outer petal is only half as long as the haft; (3) the capsule is much smaller, narrowed into a distinct neck and marked with six prominent subequal ribs; (4) seeds black not bright red.—J. G. Baker, Kew, 20th February 1900.

NOTE—ORNITHOLOGY.

Bittern near Beverley.—A fine specimen of the Bittern (*Botaurus stellaris*) was shot at the side of a ditch near Beverley on 22nd December. It is six years since this species has occurred in this district.—J. R. Lowther, Crane Hill, Beverley, 1st January 1900.

LINCOLNSHIRE COAST BOULDERS.

F. M. BURTON, F.L.S., F.G.S.,
Highfield, Gainsborough, Lincolnshire.

Mr. Harker, in his further note on this subject, which appears in this month's number of 'The Naturalist,' begins by remarking: 'It appears from Mr. Burton's communication in the November number of "The Naturalist" that he and Mr. Wheeler still reject the idea that boulders have been transported coastwise across the Humber mouth.' For my part I certainly do, and I thought I had given good and sufficient reasons for so doing. Anyway I can assure Mr. Harker that if he, or any one, could bring forward proofs (and it is those who assert the fact that are bound to prove it) of the passage across the Humber current of erratics from the Yorkshire coast, I should at once, so far, admit it, because all I desire, and seek for, is 'light and truth' in connection with the matter. I say '*so far*,' because, if such proofs could be given, they would not, and could not, do away with the fact that, all along the Lincolnshire coast, erratics occur in their natural bed—'the Hessle and Purple clays'—which is ample for the supply of all those that are found there.

Mr. Harker then, speaking of Spurn Point as a temporary resting place for the boulders coming down the Yorkshire coast, says: 'What becomes of them ultimately?' and adds, alluding to the stones at Donna Nook, 'Mr. Reid's explanation, which I quoted in my former note, seems to be the only possible deduction from the facts.' Why, I would ask, is this so? Why should not these boulders be scattered over the bed of the ocean, as I have no doubt they are?

As to the Donna Nook boulders, I have already suggested what appears to me to be the only natural and reasonable explanation about them. They came from the wearing away of a vast tract of boulder clay which must once have covered the entire coast area, and of which the cliff at Cleethorpes is the only remaining fragment.

Mr. Harker next raises the question as to where the Lincolnshire coast boulders come from, and, while admitting that boulders similar to those in Yorkshire occur embedded in the clays of that coast, he asks me to show that such clays are found in places where they are exposed to marine erosion. Now I think I might, with confidence, have left the point to be

1900 March 2.

decided on the evidence I have already adduced; but a recent visit to the Lincolnshire coast, combined with one to that of Yorkshire, last September, has enabled me not only to verify the evidence I have already given, but also to add to it.

To begin with. It is a geological fact that the whole of the Lincolnshire coast is composed of 'Newer Boulder Clay'—the 'Hessle and Purple clays' above mentioned—and that over it lies a covering of sand, thick enough to hide the clay beneath, but thin enough, when swept by wind and waves, to reveal its presence; so that patches of the clay can be seen, in various places, all down the line. All these exposed clays are, more or less, cut into long deep furrows with precipitous sides, by the rise and fall of the sea; some are furrowed right across, and others on the margins only, like miniature fiords; while the surfaces are planed level, and are being gradually denuded by the waves. On the surfaces the embedded stones can be seen lying here and there, while small pits show where others have recently been washed out; and in the furrows, and on the sides of the exposed clay beds, the stones are found lying in layers. Wherever, in fact, these clay exposures occur, there you have boulders, but on the loose sand there are practically none—only one here and there at great distances apart.

Beyond the outfall of the Bilsby Drain, about three miles south of Sutton, where the land protrudes seawards, I found a collection of stones, several hundred yards in length, near the sand-bank; and close to it were several exposures of clay to account for its appearance. In all cases, indeed, where stones occur, the clay is sure to be met with, though it may be hidden from view temporarily by a gale. Amongst these stones I found boulders similarly to those described in my first paper on this subject—p. 133 of 'The Naturalist' for 1898—with true rhomb-porphyry, gryphytes, ammonites, belemnites, and fossil wood, etc. Several of the boulders were beautifully marked with ice-scratches, as fresh as any newly taken out of their beds can be, making it impossible for them to have travelled far; and all the boulders, with but few exceptions, were angular or nearly so; those approaching at all to smoothness, such as sandstones and hardened clays, having, no doubt, been rolled by the waves when lying together in the furrows referred to, or such like places. There was an exposure of clay in one place some acres in extent, larger than any I have before seen, where the action of the sea in denuding the surface and cutting the mass into long, narrow furrows was beautifully shown; and,

there, many of the furrows were lined with the stones which had been washed out, while others were still bedded in the mass.

On going to the Yorkshire coast a totally different state of things presented itself. Shingle instead of sand. Stones smooth and rounded instead of rough and angular—all pointing to a power at work entirely at variance with that on the Lincolnshire coast.

I walked from Hornsea a long way on the shore towards the north. The cliffs were full of boulders, which, excepting a few which had been rounded before they were embedded in the mass, were as angular as those at Sutton. Those also which had just left their beds, and were lying near the cliffs, were angular. All the rest were ground and polished by the action of the waves on the stony beach. The stones at Sutton, however, are all, with few exceptions, unworn and angular; because the matrix from which they are derived lies beneath them, and they have no distance to travel.

The next day I went to Easington and walked towards Withernsea, where I had the good fortune to meet with Mr. T. Sheppard, of Hull, who kindly pointed out the shell beds and other interesting sections of the Holderness cliffs.

The day following I went to Spurn Point, and there the boulders are all rounded and worn, as they naturally would be after their travel down the coast. Spurn Point itself was a wide tract of sand, as smooth as at Sutton. This, however, may probably vary from time to time as winds and tides affect it.

One more question remains, which Mr. Harker makes a point of, and that is the size of the boulders on the Lincolnshire coast; but he has mistaken what I intended to convey in my first paper on the subject. When I mentioned sizes I alluded only to those specimens which were there described, and not to the boulders on the coast generally. Lincolnshire coast boulders, however, are not so large as those found on the Yorkshire coast, but there are some to be met with ranging in length up to about 12 or 14 inches, while a few are larger, and there is no small shingle. Perhaps, to account for this, the boulders in the 'Purple clay' are usually of less size than those in the Boulder clay, or, again, the larger boulders of the Lincolnshire coast may have been carted off for road-making as mentioned in my first paper—or they may have been taken for ballast in the small sailing boats that ply for hire, and on off-days do a little fishing, at places like Sutton and Mablethorpe. The only two

large specimens I have seen were in a disused pit at Theddlethorpe St. Helens, close to the sea bank but on its landward side, one of which is alluded to in the paper I have before referred to.

These, I think, are all the points which call for a reply in Mr. Harker's last note; and surely the evidence I have given is conclusive as to the Lincolnshire boulders being derived from the Lincolnshire coast, and from nowhere else.

Let us for a moment, however, take the opposite view and see what the belief in it involves:—

1. That, by some means or other, boulders from the Yorkshire coast are able to pass through the strong current of the Humber, and, in addition, to resist the rush of the returning tide; a tide so strong that it is able to stay the force of the Ouse and Trent; and, in the case of the latter river, to push the tidal wave, or Aëgre, up to a distance of 30 miles, and more, from its mouth.
2. That stones, smoothed and rounded by their passage down the Yorkshire coast, on leaving it, appear on the Lincolnshire side as angular as when they first left their beds.

All this I am unable to believe, and I would ask any who can do so, to go, as I have done, first to one coast and then to the other, and see if they can find anything to justify their belief.

The Rev. Canon Rowe, Principal of the Training College, Lincoln, who has been good enough to examine such of the rocks I lately collected at Sutton as had not been previously identified, in his report divides them into groups of Syenites, Syenitic Granites, Hornblende Gneisses, and Porphyritic Felspars. One of the Syenites, he says, 'seems to be rather of a Scotch type; it also resembles the Buttermere Syenite;' and, speaking generally, he says: 'These rocks are of a very different character from the drift rocks found in Essex, which are chiefly Dolerites and Basalts, Syenitic rocks being very rarely found. They appear to me rather to resemble Scotch Rocks than any others with which I am familiar.'

While preparing this paper I received a letter from Mr. Wheeler, in which he says:—

'Since I last wrote to you I have been over several miles of the coast in other parts of England, with the view of examining the action of littoral drift under different conditions, but have seen nothing to lead me to alter the opinion I have formed that you are quite right in your theory that the stones on the south shore of the Humber are from local sources and not from Holderness.'

Naturalist,

BRITISH MUSEUM
3 MAR 1900

I have also heard from the officer in charge of the Donna Nook Coastguard Station, to whom I wrote asking for information as to the quantity and sizes of the stones found there, and whether they are rough or smooth, and I give his reply ;—

'H.M. Coast Guard, Donnanook,
'16th December 1899.

'Dear Sir,

'With reference to your letter (re stones) I most respectfully beg to inform you that I have been at Donnanook and other stations on the Lincolnshire coast for the last twenty years, but have never seen any *Shingle beach* at Donnanook. You may go as far south as Sutton-on-Sea before you can come to any stones, and then they are very small, not in anyway like those found on the Yorkshire coast.

'Yours faithfully,

(Signed) 'JAS. MCCARTHY.'

20th December 1899.

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North Lancashire Varieties of the Common Polypody.—S. Lister Petty.
The Cuckoo: a Study.—Rev. E. A. W. Peacock, F.L.S., F.G.S.
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Anon. [John South Davidson].—A Few Days in Dentdale, N.D.
[Mr. J. Davidson, Dent.

Fossil Mollusca from Eocene and Oligocene, Paris Basin. Suites of these interesting Fossils, boxed, named, and localised, 40 varieties, by parcels post, on receipt of postal order for 6s. 6d.—Address R. CHARLES, Naturalist, Highcliffe-on-Sea, Christchurch, Hants.

I have also heard from the officer in charge of the Donna Nook Coastguard Station, to whom I wrote asking for information as to the quantity and sizes of the stones found there, and whether they are rough or smooth, and I give his reply :—

'H.M. Coast Guard, Donnanook,

'16th December 1899.

'Dear Sir,

'With reference to your letter (re stones) I most respectfully beg to inform you that I have been at Donnanook and other stations on the Lincolnshire coast for the last twenty years, but have never seen any *Shingle beach* at Donnanook. You may go as far south as Sutton-on-Sea before you can come to any stones, and then they are very small, not in anyway like those found on the Yorkshire coast.

'Yours faithfully,

(Signed) 'JAS. MCCARTHY.'

20th December 1899.

NOTES—ORNITHOLOGY.

Unrecorded Occurrence of the Pratincole in Lincolnshire.—A specimen of this bird (*Glareola pratincola*), sex unknown, was shot by the late Mr. Clark, of Brumby, N. Lincs., Nat. Hist. Div. 2, on Brumby Common, which borders on the river Trent, early in this century. Until lately the stuffed skin was in the possession of his heirs at Glentworth Hall, where I inspected it a few years ago.—MAX PEACOCK, Ivy House, Bottesford, Doncaster, 6th February 1900.

The Little Owl at Coleby, near Lincoln.—A specimen of this bird (*Athene noctua*), so rarely met with in England, was shot in Coleby Wood, a village on the cliff range 6½ miles south of Lincoln, on the 13th November last (1899).

Seebohm, and other authorities, speak of it as being sometimes brought into this country as a pet for aviaries, on account of its amusing gestures, and no doubt occasionally these owls get at liberty, or are set free. There is, however, no appearance of captivity in this particular bird, its plumage being untouched and perfect. It has been secured for the Lincoln Museum. —F. M. BURTON, Highfield, Gainsborough, 19th March 1900.

NOTE—MAMMALIA.

Badger near Horncastle. A few days ago a keeper at West Ashby, near Horncastle, captured a Badger (*Meles meles*). As soon as I heard of it I wrote, pleading for the Badger's life, but it was already 'dead and buried.' It seems a pity that the last representative of the Bear family in our country should be thus mercilessly slaughtered. If we are to believe naturalists, the Badger is mainly a vegetarian, and if he does occasionally indulge in flesh and blood, it is chiefly in helping our Owls to keep down the Field Mice, so destructive to our crops. The keeper in question defended himself by declaring that there were four or five more in the coverts. If he has his own way they will not be there long.—J. CONWAY WALTER, Langton Rectory, Horncastle, 10th March 1900.

NOTE—ORNITHOLOGY.

Peregrine Falcon in Notts.—On 26th December 1899 a fine bird of this species (*Falco peregrinus* Tunstall), a female I should imagine, was caught in a gin on the Winkburn estate, Southwell, Notts. From tip to tip the wings were fully 3 feet 8 inches.—E. A. WOODRUFFE-PEACOCK, Cadney, Brigg, 8th February 1900.

NOTES—BOTANY.

***Iris fœtidissima* in Lincolnshire.**—The *Iris* found by me in Careby (not Corby) Wood in 1883 was, I have no doubt, *I. fœtidissima* Linn. I did not see more than one plant, and that one was not in flower, but

1. It was in a dry part of the wood.
2. It had deep green leaves.
3. It had not the same facies as that of the plant recorded by Mr. Burton as occurring at Huttoft.
4. It was submitted to Mr. F. Arnold Lees, and he said it was 'certainly *fœtidissima*.'

—W. FOWLER, Liversedge Vicarage, 3rd March 1900.

A Belated Blossom: the Derbyshire *Dryas*.—Most unexpectedly, the recent reading by me of a not-new book adds a new item to the flora of Peakshire, which, right or wrong, being in reputable print must be taken account of by the floralist. The record, too, is for a *Roseid,* and raises afresh the instructive question of phytic removal and replacement. The book is Trevor-Battye's 'Ice-bound on Kolguev'—a drift and lime-clay island off the embouchment of the White Sea, upon the peat-bedded surface of which island Mr. Battye, as a voluntary kind of castaway, picked, and for pastime sketched, several interesting Yorkshire, Lincolnshire, and Derby species of wild flower, during the three summer months of 1894. If there be an error it is a quite inexplicable one, as Mr. Battye is a botanist, and knows the Derbyshire hill-land well enough to write at page 405 of his Kolguev book:—

'*Dryas octopetala* L. The white dryas of the Derbyshire hills was common on the Gobista Mountains and the Pugrinoy, flowering in the beginning of August.'

That the oak-leaved Avens should occur on rock ledges, not necessarily limestone, at below 1,600 feet, the average height of the mural scarves of the Eyam and Hathersage lead-mine area, is by no means unlikely, seeing that it occurs below that level on the tabular 'clouders' above Arncliffe. The district has been little worked, owing to its inaccessibility from Glossop and Hayfield, the side on which the Kinderscout and Edale edges have been mostly attacked in the past by the Manchester botanists. Of course it is against the presumption that no one but Mr. Battye has ever noticed it in the county, but the matter must be looked into. Mr. Painter's 'Flora' is not an exhaustive one, and within a score of years three or four very rare or local species of plants like *Carex ornithopoda, Silene nutans,* etc., have been discovered. Of course, too, *Dryas* may have been there, and be not now, any longer. It must be, or have been, a relic, no 'substitution' theory could account for a reversion to aboriginal conditions. But—*Dryas!* there are not many square yards of its wire matting on the Yorkshire 'clouder,' and even less may be left on the plates about the rill-heads of Derwent or Otterdale. It will be on the eastern side of the Pennine watershed, most probably on the mountain-limestone, but I do not know Derby at all well botanically. *Arenaria gothica* should occur also! Here, then, is a botanic 'Derby'—a new race for a classic badge, to be run next month, and which may be won by almost anyone with good legs and sharp eyes.—F. ARNOLD LEES, Leeds, 7th March 1900.

THE CUCKOO: A STUDY.*

Rev. EDWARD ADRIAN WOODRUFFE-PEACOCK, L.Th., F.L.S., F.G.S.,
Vicar of Cadney; Organising and Botanical Secretary, Lincolnshire Naturalists' Union.

A school examiner once asked a little girl, 'What do you know about the Cuckoo?' and received the unexpected answer, 'Please, sir, it doesn't lay its own eggs, sir.' We should not all be so forward in communicating any information we may possess, but on many points, I fear, it would hardly be more accurate; so I make no apology in introducing the Cuckoo (*Cuculus canorus* Linn.) as one of our subjects this evening. I once gave up three spring and summer months to the study of the life-history of this bird, by daylight in the fields and by night in copses and woods and the library, and have ever since taken great interest in any information regarding it. These notes, however, do not all claim to be original as observations, or even in the language in which they are expressed, for I have freely borrowed from my predecessors; but, though it is quite impossible for me to state who first recorded all the known facts, I hope you will bear patiently with me while I enter sometimes a little fully into detail. Notwithstanding all the literature devoted to the Cuckoo, which is without doubt the most interesting bird that visits this country for nesting purposes, little is known of many of its more intimate peculiarities. Almost anyone, who has the opportunity and will give time and patience to the subject, could by careful observation add many exact facts to our present knowledge, or settle some much-disputed point in the domestic economy of this parasitical† bird. I do not mean by using the gun, and studying them in the flesh; all that can be found out in that way is known already; but rather by watching their habits in the perfectly free state of nature, and unravelling in this way

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*Being a portion of a lecture delivered by request in the Church House, Lincoln, on 7th November 1893, and at Louth, 23rd February 1899, before the Louth Antiquarian and Naturalists' Society, with later notes added to bring the whole up to date for next season's observations.

†Another parasitical bird, the so-called Cow-bird (*Molobrus*), of North America, succeeds in getting rid of the offspring of the foster-parents. A friend of mine informs me that, according to an American newspaper-cutting, which was sent to her some years ago, the Cow-bird visits her young one after it has been hatched, and continues to watch over it for some time. Will some ornithologist, within reach of a good reference library, look up this matter and give me the result of his researches?

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the many secrets of their strange life. I most strongly disapprove of the use of the gun in natural history work, excepting on the rarest occasions, and then only when a master of the highest repute, like Professor Newton or the late John Cordeaux, is at hand to authorise and take full advantage of the slaughter.*

I have not time to describe with full particulars how I daily watched a pair of Pied Wagtails (*Motacilla lugubris* Tem.) building their nest under a stone, just above a little ledge, about half-way down the bank of the brook at Harrington, Northamptonshire. This nest contained four eggs, when a hen Cuckoo visited the spot about nine o'clock one morning, while its rightful owners were away feeding. I had seen her about for some days, and, despite morning mists and heavy dews, had determined, if possible, to learn some of the secrets of her domestic life. She had been flying about the neighbourhood, followed, chased I might say, by a number of eager suitors, once as many as five together, contending for the favour of wooing her, as she took short flights from tree to wood or wood to hedge. At times the cock birds cuckooed loudly, not infrequently on the wing, not more than twenty yards from my place of observation. They also used other strange notes of anger, surprise, pleasure, or endearment, call them what you will, which are many of them quite unknown even to the majority of bird-lovers.

When the Cuckoo arrived at the beck side on the morning I am telling you of, she spent some time in looking about and prospecting, and finally flew down and examined the aperture of the Wagtail's nest. Returning to the top of the bank, after a period spent in sunning herself on the bare ground, she deliberately laid her egg there. Then, taking it up in her bill, she fluttered tenderly down the bank again, and placing it carefully in the nest of its chosen foster-parents, flew away. This egg took fourteen days to incubate, the young Cuckoo being the first bird to appear. On the fourth day it began to thrust its foster-brothers from the nest, and was its only occupant by the evening of the eighth. At the end of three weeks it fluttered out of the nest on to the bank, and remained about

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* If a Cuckoo must be shot, the contents of its crop and gizzard should be carefully taken out and transferred to two wide-mouthed bottles, and petroleum—common paraffin will do—added. It does not burn the colour out as rapidly as spirits of wine. After being tightly corked they should be carefully packed, full notes being appended, and sent to the nearest entomologist or lepidopterist, or to me, with a request to examine and report on the species it contains in 'The Naturalist.'

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the beck and neighbouring hedges for many weeks, zealously guarded by its foster-parents, and fed by them and other birds—Hedge-Sparrows and Tit-Larks.

The Cuckoo or 'Gowk,' which is 'he' in the South of England and 'she' in Lincolnshire and the North generally, leaves its winter quarters in Africa at the end of March, and a month later is found all over Europe as far as the Arctic circle. The old birds remain eleven or twelve weeks with us, and the young ones retire South six to eight weeks later. The males arrive first, and at once proclaim their presence to all the world by their loud and peculiar cry. As soon as the female birds have followed, and are distributed, furious contests take place between their rival suitors, which are supposed—I only say *supposed*, for it is a point which requires settling by careful work in the field—which are *supposed* to be more numerous than the hen birds. If night overtake the combatants, as it often does, before the supremacy of one bird is decided, they continue calling at intervals through the hours of darkness, only awaiting the light for the renewal of the contest of love. Later in the season, when the cock birds have become more distributed, each would almost seem to have a district or special haunt of his own, where he calls as he lists, and consorts with the hens, whose more roving nest-seeking habits bring them into his vicinity. As the late spring passes into the full tide of summer the well-known cry is less and less frequently heard, till before mid-summer day is reached it has lost all its resonance and clearness. The first syllable of the courting note is at times doubled, not infrequently trebled; once only I heard it repeated five times, but this was exceptional. The 'plain song' and 'failing note' of this bird are so very different that 'the stuttering Cuckoo,' as Southey calls it, might well be mistaken for another bird. It has several other notes besides its familiar cry, as I said before, which almost defy description. One is a soft guttural note of pleasure, 'uttered rapidly and continuously repeated several times.' This is a courting cry. Another is an exclamation of anger or fear, as when the bird is suddenly disturbed whilst sunning itself in an old gravel pit or an open glade of the woods. It is perhaps nothing more than the cry just referred to in a harsher and much less frequent form. There is yet another note 'like the bark of a dog,' very seldom heard, and then only at the end of the season, which causes me to believe that it is but 'the remnant of a voice,' a 'vox et præterea nihil' of its spring call. It is more often heard than

recognised as the cry of the Cuckoo, I believe. The first time I heard it clearly and saw the bird, I startled a Cuckoo from sunning itself on the ground on the hedge bank of a wood, and could hardly trust my ears and eyes. This cry, rarely though it is recognised by anyone except labouring men, who are always in the fields, has given, I believe, the second name 'Gowk' to the Cuckoo, for it exactly expresses the sound made by the bird. The Rev. G. S. Streatfeild says that the place called Gokewell Priory takes its name from the Cuckoo. It comes from O. N. 'gaukr,' A. S. 'geac,' a Cuckoo. The Cuckoo is still known as the 'Gowk,' and the Owl as the 'Glimmer-gowk,' in Lincolnshire. We have 'Herbertus Gowk' in the Hundred Rolls, and the surname 'Gowk' has survived to the present day. Lastly, there is a note seldom heard except by countrymen and watchers who are on the look out for it, which has been compared, not badly, with the blutter of the Curlew. This note sometimes precedes, and sometimes follows, the ordinary loud and mellow spring cry. It can be heard by anyone almost on a May evening who will hide himself away in a wood or thicket, and 'Cuckoo-call' into his folded hands 'navvy-railway-whistle fashion,' if he has the wit to catch the right pause and intonation. In half-an-hour he will have every cock bird in the neighbourhood within a few yards of his hiding-place, giving him such a treat in the way of curious, not to say ridiculous sounds, as he has ever heard from a bird's mouth. It has been most fruitlessly rendered by words, and is really quite beyond the reach of such artificial modes of reproduction. It is a kind of churning, chuckling, gurgling sound produced by the tongue and throat together with constant changes in the inflection of the voice, during which the throat seems disturbed. I have a brother, known to some of you, who in youth was an adept at 'Cuckoo-calling,' and who could take these curious notes to perfection. On one well-remembered occasion he rendered them so remarkably well that we both laughed aloud at the facial contortions required for their perfect reproduction, and frightened six birds away for the night. The young birds have a plaintive chirp, said to be like that of their foster-parents. I should certainly not have recognised it as an imitative note.

The Cuckoo is a very shy bird, avoiding observation as much as possible. It frequents woods and bushes, or broken and rough ground, and may almost be called an arboreal bird. It is never found very far away from water, as it has a great and frequent thirst. It is very fond of resting on the ground among

herbage, where caterpillars, its usual food, are most plentiful; and so is not infrequently flushed from among the gooseberry bushes in gardens during the early morning hours when men are just astir. At times it may be seen flitting about in the open fields, but seldom, and then only in the early spring. For all the little birds of the more open country are soon up and on the defensive, twittering in dismay as they hunt and pursue it as though it were a Hawk, 'to which, indeed, its mode of flight, homely grey vesture, and equivocal shape, give it an undoubted resemblance.' This mistake is not confined to birds alone. A gamekeeper once remarked:—'The Cuckoo turns into a Hawk in winter'; and when a mild look of surprise passed over the face of his hearer, he added the clinching question:—'Leastways what becomes of the Cuckoos?'

The breeding habits of the Cuckoo are its most singular peculiarity. Some of them we are fully acquainted with, at others we can merely guess as yet. The first eggs are laid in May. The hen chooses the nest of some insectivorous bird to receive each one, instead of making a nest of her own. The Pied Wagtail, Hedge Sparrow, and Tit-Lark are the favourites in England. In Scotland, according to one writer, always the latter bird. In Lincolnshire I had never heard of it, excepting in the nests of the Pied Wagtail or its congener the Grey Wagtail (*M. melanope* Pallas), which bred not infrequently on Bottesford Beck thirty years ago, and since in other places, as Mr. Cordeaux has proved. But after delivering this lecture at Lincoln some years ago, Mrs. Petchel sent me a message by our common friend Mr. Sneath, to say that she once had a Cuckoo hatched out in a Robin's nest in her garden in the heart of the city. It looks as if the nest is a mere case of handiness and convenience, if one of a favourite species is not known at the time; as a matter of fact, a Cuckoo's egg has been found in a Rook's nest. I formerly believed that the bird placed her egg in every case in the chosen nest in the way I have described with her bill, and that from frequently being seen in the act of transporting her own egg to a previously chosen nest, she has been accused of stealing those of the victims of her trickery to give 'lucid intonation and unfettered utterance to her voice,' or as the old song of my childhood's days says

> The Cuckoo is a merry bird;
> She sings as she flies;
> She brings us good tidings
> And tells us no lies.

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She sucks little bird-eggs,
To make her voice clear;
And then she sings 'cuckoo'
Three months in the year.

This ancient rhyme is noteworthy for two reasons. First, it says the bird 'sings as she flies.' They do so in the earlier part of the season, especially when there is more than one male courting a single female bird. You may then have two or more Cuckoos disregarding your presence at twenty yards' distance, and apparently calling one another 'bad names' vigorously as they fly past you. Later on in the season, when they are fully distributed, this is rarely the case, for the bird seeks shelter from persecution and generally calls from cover. Secondly, the verses assert 'She sucks little bird-eggs,' and for years I have refused to believe this to be a fact, though shepherds and labouring men of credit assured me that the Cuckoo sometimes places the egg in the nest with her bill and sometimes gets into the nest to lay it; sometimes, though rarely, casts the eggs out of the nest she finds there; and more rarely still, is caught in the act of sucking other birds' eggs. The evidence has now grown so strong against the female bird that I can no longer reject it as untrustworthy. Accurate and painstaking friends tell me they have seen these things too. Then the Rev. J. G. Tuck, of Tostock Rectory, printed the following statement and forwarded it to me:—

That the Cuckoo does at times turn out eggs to make room for her own is pretty certain, for, as already recorded, last June I put up by way of experiment a Greenfinch's nest with three fresh eggs in the ivy on our garden wall. From this nest the eggs were all turned out, undoubtedly by the Cuckoo, as I found one egg lying broken on the ground below, and the Cuckoo's egg left in its place.

Again, Miss L. M. Forster comes forward with most circumstantial evidence in a case where there is no chance of a mistake. She writes:—

For two years running, 1897 and 1898, a Pied Wagtail built its nest in the greenhouse of a lady who lives near Guildford, and laid its eggs there. Each year a Cuckoo deposited an egg in the nest. The second spring, 1898, days after the Cuckoo had placed her egg in the nest, the gardener watched her trying to effect an entrance to the greenhouse, and eventually he saw her go in and come out again; after she had gone he examined the nest and found the young Cuckoo only just emerged from the shell, and with part of the shell still on its back, while all the young Wagtails and one egg were lying on the shelf; one young bird not being quite dead. The remarkable part of this experience is, that it shows the Cuckoo must have kept some count of time, and known when her egg was likely to be hatched.

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I know every detail of this case, and there can be no getting over the evidence. It has only confirmed what I believed to be partly true before, that to a certain extent the Cuckoo *does watch* over its young. Finally, Mr. T. R. Whitaker, of Rainworth, Notts, writes :—

We have a Garden Warbler's nest in a currant tree close to the house, in which were three good eggs and one bad. A Cuckoo turned the three good ones out of the nest and deposited her egg with the bad one. The three eggs were nearly hatching when this occurred.

The last touch of confirmation was added by Mr. G. Bazeley, naturalist, Horsemarket, Northampton, who wrote :—

My wife and I were resting in the evening beneath an ash tree while my little son was engaged in gathering bluebells ; close by I had picked up the shell of a Partridge's egg, and, while examining it, a Cuckoo was heard in the tree above. Almost directly another shell fell from the branches, and the bird flew away, returning in a few minutes with an egg, the shell of which soon dropped to the ground. This last I noticed still contained a lot of white. Anyone who has reared a young Cuckoo would not be surprised at the bird making an evening meal off the number of eggs stated, but their contents might have been shared with a mate ; in such a case these would have been taken into the throat and the bird would then have fed its mate. I was not able to watch where the Cuckoo went to each time, but in an adjacent field I noticed several Partridges behaving in an excited way, the pairs all racing each other about, and I judged these were the birds which had been disturbed. Upon leaving the spot I met Mr. Beesley, of the Mill, St. James' End, Northampton, and he at once asked me the name of an egg-shell he had found ; it was another Partridge's egg opened in a similar way to those I had seen. Altogether fourteen were discovered. This all occurred on the estate belonging to General Sotheby, near Earls Barton, and on 25th May 1899. I saw Mr. Smith, the gentleman's game-keeper, the next day, and related the incident to him.

In very many cases the Cuckoo chooses a nest, especially that of the Wagtail, so situated that it would be quite impossible for her to place the egg in it by any other means than those she uses. I have understood since, though I had no idea of it at the time,* that I was the first person in this country that ever observed the bird in the act, but of late years more than one careful watcher has seen it. I remember one case, too, where the opening was so small, it was in a Wagtail's nest in a rubble wall, that the half-grown bird could not escape from the nest hole till a labourer, overhearing its cries, set it free, after fetching me to see the position it was found in. The Cuckoo is fond of searching an ivied wall, when her little bird enemies will let her, or the fruit trees nailed to brickwork, for a nest to her liking in which to deposit her egg. It may be seen

* The labouring-men about my home having told me this was the way the bird generally deposited its eggs.

creeping along a branch like a Parrot for a long distance at a time, without using its wings, its zygodactyle feet, with two toes behind and two in front, being admirably adapted for the purpose. If a nest with *fresh laid* eggs is securely placed in a natural and suitable position a bird will sometimes lay her egg in it. Occasionally two Cuckoo's eggs are found in one nest, but they are generally supposed to be the deposits of different birds. We do not yet know how many eggs the Cuckoo lays in a season; and the period of time that elapses between the depositing of each egg is equally a matter of uncertainty.

The small size of the Cuckoo's egg is also very remarkable. In the words of the late G. T. Romanes, who studied this bird carefully:—'The egg of the Cuckoo is not larger than that of the Skylark, although an adult Cuckoo is four times the size of a full grown Skylark.' In another place he also adds:—'The small size of the egg is a real case of adaption—in order to deceive the small birds in whose nest it is laid—we may infer from the fact of the non-parasitic American Cuckoo (*Coccyzus americanus*) laying full-sized eggs.' To this I reply it may be so, but there is a much simpler explanation. This learned author seems to have overlooked the fact that in almost every case the European Cuckoo carries her egg in her bill, and those which had small eggs would more easily achieve their object, and hence by the theory of evolution the elimination of the larger egg-producers would follow. In considering this point fully, the wide gape of the Cuckoo should not be forgotten. Compare that of the Night Jar and its food. Another noteworthy point is the uncertain shade and markings of Cuckoo's eggs. They are often *approximately*—mind you, I only say *approximately*—coloured and flecked like those of the birds in whose nests they are found. This no doubt aids in more thoroughly deceiving the foster-parents. But I must hasten to add that this is not invariably the case; and even the country lad of limited experience can distinguish the Cuckoo's egg at a glance. In Lincolnshire the egg is invariably of the 'grey type,' as it is called. I have never heard of the 'blue' and 'red types' found elsewhere. The egg, as I have already said, takes fourteen days to incubate, and the young Cuckoo is usually, but by no means always, first hatched. When it comes from the shell it is 'perfectly naked, without a vestige of feather, or even a hint of future feathers. Its eyes are not yet opened, and it seems too weak to support the weight of its own head, though its legs are well developed and muscular.' Then follows the

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most wonderful fact in the life history of this strangest of birds. I mean the murderous eviction of the rightful owners of the nest by the intruder. For beginning about the fourth day, it hoists them one after another in succession on its broad back, where for some days at least there is a depression between the shoulders for the purpose, and keeping them balanced with its upraised wings, it heaves them over the side of the nest to die neglected by their own parents, of whose solicitous care he becomes the only object. Unhatched eggs are often treated in the same way, we are told; and when two Cuckoos are found in one nest a prolonged battle goes on for days as to which shall evict the other. The famous Jenner, the discoverer of vaccination, which is in such bad repute now with the ignorant, was the first person to observe and give a full account of the young Cuckoo's proceedings. For years he was not credited, but in later times observers all over Europe have proved that he was perfectly accurate in all his statements, as I can personally avow. After I had given this lecture at Lincoln, Mr. Arthur Garfit told me that he himself had watched every detail of the life history of the Cuckoo while in the nest, and was prepared to substantiate my facts.

From the moment of its appearance from the shell, the young Cuckoo is insatiable in its cravings for food, and keeps its foster-parents continually busy. When it gets a fairly large bird, they may be seen at times standing between its shoulders in order to reach and stuff its open mouth. It has such a marvellous attractive power over its feathered companions, that not only do the foster-birds feed it, but also many other old birds, and at times even young ones only just able to feed themselves. They will even visit cages where the birds are confined, as I know as a fact personally. Even a bird as tiny as the Wren (*Troglodytes parvulus* K. L. Koch) has been known to adopt the caged young Cuckoo, and a more comical sight would be hard to imagine than the large bird flapping its wings with joy and opening its huge beak to receive the food its 'little mother' drops into it.

It leaves the nest in three weeks, and in another fortnight can fly well, and by the middle of September it has departed, having followed its parents to Africa. Both Buffon and Bechstein agree that the Cuckoo can be kept in captivity, but my own attempts have always failed through want of time, the proper food, and heat. Great care must be taken to keep them from cold from autumn to spring, for this is the critical time when

nearly all die. In captivity it is an obstinate, furious, and melancholy bird, and such a voracious eater as to be a most disagreeable bird in the aviary. For food it requires insects, caterpillars, and meat, and they must be given every few minutes till it can feed itself. The reward of much patience would certainly be a great addition to our knowledge, if a few could be kept to maturity.

I publish these notes, the summary of twenty years' work on the Cuckoo, in the hope that some naturalist, who is a photographer, will take up this bird as a special study. We want photographs of the Cuckoo visiting a nest prospecting, carrying and placing its egg, removing eggs or young birds, and sucking eggs, of the naked and blind nestling ejecting eggs or foster-brothers. Anyone desirous of making a study of this bird should especially make full notes on the following points:—(1) Do the cock birds arrive first? (2) Are they more numerous than the hens? (3) Is the well-known spring-cry peculiar to the male bird? (4) All other sounds made by both sexes should be noted. (5) How many species of birds' nests are used in a given district. (6) How frequently the hen Cuckoo turns out the eggs when she deposits her own. (7) If the foster-birds ever turn out the egg she *sometimes* leaves in their nest before they have laid any of their own. (8) The date when she lays her first egg. (9) How many eggs she lays. (10) What is the interval between them. (11) Egg marking and ground colouration in relation to the species in whose nest the egg is deposited, and to the Cuckoo's eggs generally over a wide district. My friend Mr. W. Denison Roebuck will only be too willing and ready to publish any new or carefully-recorded facts illustrating any of these points. Personally, I shall be very pleased to hear from anyone who has observations to communicate.

NOTES—ORNITHOLOGY.

Spotted Redshank near Boston.—A Spotted Redshank (*Totanus fuscus*) was recently shot in the Marsh, near Boston, by Captain Bottomley, and is being stuffed by Mr. Nash, successor to Mr. Fieldsend, at Lincoln. I was recently told of another specimen of the same bird being shot near Hunstanton.—J. Conway Walter, Langton Rectory, Horncastle, 17th March 1900.

Little Auks at Boston.—At Boston two Little Auks (*Mergulus alle*) were captured after the late stormy weather. One of these was picked up on 1st March by the groom of Mr. C. Wright, J.P., of Boston, lying in an exhausted state on the lawn.

Earlier in the same week, Mr. R. Sissons, engineer of the tug 'Boston,' caught another in his landing-net, floating exhausted on the Witham.

Both these are being stuffed by Mr. Wakefield, of West Street, Boston. —J. Conway Walter, Langton Rectory, Horncastle, 24th March 1900.

BIRD MIGRATION RETURNS FROM THE SPURN AND FLAMBOROUGH LIGHTHOUSES FOR THE YEAR 1899.

OXLEY GRABHAM, M.A., M.B.O.U.,
Chestnut House, Heworth, York.

For the above I am indebted to Mr. Counter, at the Spurn, and Mr. Laurence, at the Flamborough, Lighthouse. The observations at the latter station did not commence till the second half of the year. When not otherwise specified the notes refer to the Spurn Lighthouse.

2nd January 1899.—Cormorant shot near the Spurn.

7th January.—At 6 p.m. a Coot struck the lantern and was killed.

9th January.—Great numbers of Snow Buntings about.

1st February.—A Pigeon struck the lantern and was killed.

11th February.—Eight p.m., a Lark was killed. Some Starlings and Redwings flying round.

16th February.—A Gull struck the lantern. Starlings and Blackbirds flying round.

2nd March.—Several Crows and Snow Buntings about.

11th March.—A fair number of birds about; several striking the lantern. Redwings, Larks, Starlings, Fieldfares, and Curlew. Mr. Counter says that the Curlew never strike the lantern.

15th March.—Large flocks of Knot flying both north and south.

20th March.—Two Golden Plover seen amongst the dunes.

30th March.—Many Rooks flying south. Snow Buntings still about.

2nd April.—Many birds flying round the lantern. The following were killed:—Five Water Rails, one Grey Plover, six Starlings, and six Wheatears.

14th April.—A Golden Plover struck the lantern and was killed.

15th April.—A few Lapwings, Golden-crested Wrens, and Robins amongst the dunes.

27th April.—Terns observed about for the first time this season.

28th April.—Several Redstarts seen.

10th May.—Starlings, Wheatears, and Oystercatchers flying around the light.

11th May.—A Purple Sandpiper killed.

13th May.—Great numbers of birds flying round the light. Warblers, Willow Wrens, Pied Flycatchers, Fieldfares, Plover, Curlew, Oystercatchers, Corncrakes, Wheatears, and Knot; over 90 small Warblers, Willow Wrens, and Wheatears were picked up at the foot of the tower dead; also a Landrail and a Knot in summer plumage. A large number of moths were also flying round the light.

22nd June.—Several flocks of young Starlings were flying about.

31st July.—Two small flocks of Knot were observed flying north.

15th August.—Between 9 and 11 p.m. several Terns and small birds flying about the light. Wind S.W., and hazy. The wind shifted to the N.W. and they all cleared away. One Tern killed by striking.

6th September.—A Knot killed against the lantern. Wind S.W.

7th September.—About 300 Gulls flying round the light, many striking; also several Terns and Knot. Wind S.W. to N.W., overcast and clear.

8th September.—A few Redstarts and Thrushes round the light.

27th September.—Swallows flying south. Wind west. A Golden-crested Wren flying round the lantern.

30th September.—Several birds struck the lantern: one Knot, one young Ringed Plover, two Dunlin, two Larks, one Starling.

4th October.—Great numbers of Swallows flying south at the Spurn. Wind W.N.W. Bramblings on the dunes.

6th October.—Blackcap Warblers in the garden round the Flamborough Lighthouse.

7th October.—First Woodcock of the season at the Spurn.

8th October.—Rooks and Larks flying west all day at Flamborough.

13th October.—The first Hooded Crows seen at the Head, Flamborough.

14th October.—Great numbers of Rooks and Hooded Crows passing to the west at Flamborough. Wind N.W., fresh breeze, weather clear.

15th October.—From midnight to daybreak great numbers of Redwings, Blackbirds, Chaffinches, and Fieldfares passing the Flamborough Light. Mr. Counter also reports many Chaffinches passing the Spurn Light. Weather clear; wind working from N.E. to S.E., a gentle breeze.

22nd October.—From midnight till after 9 a.m. great numbers of Larks, Fieldfares, Redwings, Blackbirds, and Starlings passing the Flamborough Light to the west. Wind from S.E. to S.W.; weather misty, and fog at intervals.

26th October.—Golden-crested Wrens flying round the Spurn Light. A Landrail, a Starling, and a Dunlin killed. At Flamborough, Rooks, Golden-crested Wrens, Larks, and Starlings sitting on the balcony of the lighthouse.

28th October.—Eight a.m., large flights of Rooks and Hooded Crows coming from the N.E. and passing W.S.W. at Flamborough. Weather very misty. Wind E.N.E. up to midnight, then backed into the W.S.W.

31st October.—Mr. Laurence reports a single Swallow flying round the Flamborough Lighthouse. Weather fine. Wind westerly.

1st November.—Several birds flying round the Spurn Light, Starlings, Larks, Blackbirds, Thrushes, Redwings, and Dunlin. Wind S.S.W.; overcast and dark. Large flights of Finches at Flamborough.

5th November.—Great numbers of birds flying round the Spurn Light. Starlings, Larks, Lapwings, Thrushes, Fieldfares, Chaffinches, and Golden-crested Wrens. Wind S.W.

15th November.—Hundreds of Rooks, Finches, Redwings, and Blackbirds at Flamborough; coming from the east and flying to the west. Wind E.N.E. At Spurn, Starlings, Blackbirds, Redwings, Larks, and Lapwings struck the lantern. Two Woodcocks and a Merlin observed among the dunes.

20th November.—Large flocks of Knot flying north at the Spurn. Wind N.N.W.

27th November.—Large flocks of Snow Buntings in the fields round the Flamborough Lighthouse. Wind W.S.W.; squally. At the Spurn great numbers of Wood Pigeons flying S.W. A good many Wigeon along shore.

29th November.—11.50 a.m., large flights of Rooks and Greenfinches coming from the east at Flamborough; all going west. Wind W.S.W.

30th November.—A Leach's Petrel, several Blackbirds, Redwings, Starlings, and Larks struck the Spurn lantern.

4th December.—Starlings, Blackbirds, Lapwings, Golden Plover, Gulls, Dunlin, and Snipe flying round the Spurn Light.

6th December.—Great numbers of birds round the Spurn Light. Lapwings, Golden Plover, Knot, Gulls, Curlew, Dunlin, Crows, and Oystercatchers. The following were killed by striking the lantern :—Seventeen Golden Plover, two Lapwings, one Dunlin, one Jack Snipe. Wind S.S.E. Large numbers of Lapwings, Golden Plover, and Snipe were reported by Mr. Laurence to be flying round the Flamborough Light.

13th December.—Owing to the frost and snow hundreds of birds of various species were on the beach and amongst the dunes at the Spurn. Mallard, Wigeon, Snipe, Knot, Lapwing, Golden Plover, and many small birds.

14th December.—Large flocks of Duck and Knot flying from the northward to the Lincolnshire coast. Wind N.N.W. at the Spurn.

23rd December.—Many Knot, Whimbrel, Curlew, Oystercatchers, Larks, Starlings, Fieldfares, and Dunlin flying round the Spurn Light. The following were killed :—Eight Knot, three Dunlin, one Whimbrel, two Fieldfares, six Starlings, and four Larks. Wind S.W. ; fog.

24th December.—A good number of Larks flying round the Spurn Light. Four killed. Wind W.S.W. ; hazy.

NOTES—ORNITHOLOGY.

Smews near Beverley.—Mr. J. Coates, of Flemingate, Beverley, informs me that he shot a fine female of the Smew (*Mergus albellus*) on the river Hull, near Beverley, in December last. This bird is a regular winter visitor to the river Hull, and we generally have records of specimens shot, usually males.—J. R. LOWTHER, Crane Hill, Beverley, 19th March 1900.

The Wryneck as a Durham Bird.—The Wryneck (*Iynx torquilla*), one of the most beautiful of our spring and autumn visitants, is only a rare bird in Durham. It generally arrives in April and leaves again in September or October. During the last twenty years, if not more, it seems to have become much rarer than it used to be. It has bred in this county. A pair, according to the late John Hancock, nested in 1813, and for four or five years afterwards, in the garden of the Rev. George Cooper Abbs, of Cleadon House, South Shields. I have known it to breed only once—in the Browney Valley—in 1882, since which date I have not seen the bird or heard of its appearance in this county. The late Thomas Grundy, my collaborator in 'Notes on the Birds of the Derwent Valley,' drawn up for the Vale of Derwent Naturalists' Field Club in 1890, and printed in their Transactions (Vol. 1, 1891), stated that 'When a boy (about 1825 and after) it [the Wryneck] was very common at Ravensworth, and I have taken eggs out of old willow trees. Each nest generally contained six eggs. I think it has now become extinct.' I should like ornithologists and observers of bird life in the North of England, and kindred readers of 'The Naturalist,' to give their personal knowledge of this little visitant in the different counties in this part of Britain [so would the Editor].—J. W. FAWCETT, Satley Grange, Tow Law, 20th February 1900.

THE HAWFINCH AS A DURHAM BIRD.

J. W. FAWCETT.

Satley Grange, Tow Law; Author of 'The Birds of Durham,' etc.

THERE seems to be a number of birds which are annually increasing and making their way further northwards during the breeding season. Of these are the Hawfinch, the Pied Flycatcher, the Starling, and the Stockdove. The Hawfinch (*Coccothraustes vulgaris*) was formerly only a rare casual visitant to the county of Durham, but as years rolled on it became an autumn and winter visitant. Now, however, it can be claimed as a resident. Mr. Selby, in his Catalogue of Birds published in 1831, states that 'two specimens were some time ago shot near Stockton-upon-Tees,' and Mr. Hancock, in his catalogue published in 1874, states that he had three examples which were shot in Streatlam Park; one many years since, and two, a male and female, in the winter of 1837.' He also states that it had not been known to have bred in either Durham or Northumberland. Since the early eighties, however, it has become more frequent. In 1880, 1881, and 1882 one or two were seen in October and November of each year in this county. In 1883, however, two pairs at least were found nesting in Northumberland, one nest and eggs of which were unfortunately taken, and in the same year specimens were seen in July in Durham in gardens in two separate localities (in the lower Derwent and in Teesdale), feeding on green peas, and it is probable that they nested that year in this county. Four examples were also shot at Middleton-in-Teesdale in the autumn of 1883. In 1884 they nested in Axwell Park, in the lower Derwent Valley, and one, if not two, nests and eggs were taken by egg-hunters. They were also seen in the Ravensworth and Gibside woods in the same year, and probably bred. In 1885 they were seen at Axwell in March and April, and bred during the year in that locality, at least four separate nests being known, of which two nests, with five eggs each, were taken in May. The birds nested in fir trees at an elevation of about thirty feet. A pair nested at Middleton-in-Teesdale in June of the same year, and in the following month a male and a young bird (apparently not long out of the nest) were shot in that district, and were probably part of the family that bred there. In 1886 the Hawfinch again nested in the Derwent Valley in Axwell Park, where at least two broods were hatched, and also in a wood on

the Gibside estate. Four different nests were known to have been reared in 1887 in the Derwent Valley, three in 1888, four in 1889, and five in 1890. Since then they have bred regularly in that district. It also bred in Upper Teesdale in 1892.

NOTES—ORNITHOLOGY.

Pied Varieties of Common Bunting and Missel-Thrush near Horncastle.—Among the regrettable slaughters of birds which have occurred of late, although in the case of a Lusus Naturæ, whose perpetuation may not be desirable, the destruction is of less importance, are the following:—

Mr. W. S. Gaunt, of Stixwould, near Woodhall Spa, shot a few weeks ago a bird which attracted his attention as being uncommon. It proved to be a pied specimen of the Common Bunting (*Emberiza miliaria*). Its neck was canary yellow, head a still lighter yellow, breast rather darker, wings and tail more like a Chaffinch, brown and grey.

Mr. Hubert Walter, of Horncastle, recently shot on the Glebe Farm, Thimbleby, a fine specimen of the Missel-Thrush or Storm-cock (*Turdus viscivorus*), with unusual markings. The breast was light brown above, silver-grey below; the wings buff, with silver-grey tips; the head and back a blended mixture of white, buff, and fawn colour.—J. Conway Walter, Langton Rectory, Horncastle, 24th March 1900.

The Cuckoo: Additional Notes.—Since the lecture printed at pp. 99-108 of this number was prepared for the press the following notes have come to hand:—In North Lincolnshire 54 the Cuckoo's egg has been found in the nests of the Pied and Grey Wagtails, Robin, Hedge Sparrow, and Linnet. In South Lincolnshire 53 in the nests of the Meadow Pipit, Yellow Bunting, Pied Wagtail, Sedge and Reed Warblers. Further notes are wanted. A monograph by Alexander H. Japp, LL.D., F.R.S.E., entitled, 'Our Common Cuckoo and other Cuckoos and Parasitical Birds,' 1899, must be obtained by all students of this bird; and would be invaluable if it were half the length, better arranged, and less controversial. It is illustrated by photographs of the newly-hatched bird ejecting eggs and young from the nest; but further and finer examples should be obtained, if possible. I have watched this in two cases, both in Northamptonshire, and my experience is that the young Cuckoos were not active till the fourth day, and that the instinct had passed away on the ninth day. It seems that frequently the instinct shows much earlier and lasts even longer. Notes on this point are of value.—E. A. W. Peacock, Cadney, 28th March 1900.

NOTE—MAMMALIA.

Natterer's Bat near Barnsley.—The enclosed specimen of *Vespertilio nattereri* was taken along with another of the same species and three *Plecotus auritus* by my friend, A. Whitaker, and myself on 3rd March 1900. They were suspended in holes in the roof of a short disused tunnel in Broomroyd Wood, Stainborough, near Barnsley, and this one was in the same hole as one of the Long-eared Bats.—Joseph Armitage, 129, Park Road, Barnsley, 12th March 1900.

NOTE—FUNGI.

***Peziza coccinea* in Forge Valley.**—As I was walking in Forge Valley one afternoon early in March, my attention was arrested by a fine display of colour. I found it was produced by a number of vivid scarlet cups, somewhat smaller than egg cups, resting upon a cushion of shining green moss. I sent a specimen of the fungus to Mr. Roebuck, who was good enough to get it named for me by Mr. Charles Crossland, F.L.S. It proves to be *Geopyxis coccinea* (Jacq.) = *Peziza coccinea* (Jacq.). The effect produced was as brilliant as that of Scarlet Pelargoniums.—W. C. Hey, Derwent House, West Ayton, Yorkshire, 28th March 1900.

Naturalist,

SOME WHITBY POLYZOA, ETC.

S. LISTER PETTY,
Ulverston.

WITHOUT daring to say definitely that nothing has been done in Polyzoa, etc., from Whitby and neighbourhood in recent years, I can hardly be far wrong, I fear, in stating that little has been written. Dr. Hincks, in 'Brit. Marine Polyzoa,' 1880, locates one species only, *Buskia nitens*, from Whitby, whilst in the 'Zoophytes' he gives several species from the locality.

To collect satisfactorily on the Scar a pair of sea-boots would be useful, if heavy, but my specimens were gathered without such aid, and did not entail more than a change of boots; for with the thermometer at 130°F. in the sun (31st July 1899) at mid-day no collecting was advisable which required exertion. So then the list must be taken as a sort of holiday task, something to keep the list-maker out of mischief and give an excuse for idling about the shore, instead of scouring the surrounding country—'doing Yorkshire,' in fact.

The area is from about half-a-mile east of Sandsend to Saltwick Nab. Some of the specimens have been submitted to the Marine Biology Committee of the Y.N.U. If any reader has a collection of named and located seaweeds from Robin Hood's Bay, Whitby, or Sandsend, and would lend them to me for a short time, I should be much obliged, as they might harbour some species not in the list below. The collection would of course be carefully treated and returned so soon as possible, post paid.

POLYZOA.

Eucratea chelata L. On *Hydrallmania, Scrupocellaria scruposa*, and *Maugeria sanguinea* Gray (=*Delesseria* Spreng).

Scrupocellaria scruposa L. Some loose pieces.

Scrupocellaria reptans L. On *Flustra foliacea*.

Flustra foliacea L. On *Laminaria digitata* Lamouroux, and a young colony on *Fucus vesiculosus* L., and good pieces alone.

Flustra securifrons Pallas. On the Scar only.

Membranipora pilosa L. On *Maugeria, Dasya coccinea* Ag., and on a red weed which I am unable to name; on the remains of a small shell on *Hydrallmania*.

Membranipora dentata [Hincks gives no authority for name]. On *Maugeria* and *Dasya*.

1900 April 3.

Membranipora membranacea L. On *Hydrallmania* and *Sertularia operculata*. With the 'Tower-cells' of Nitsche on *Laminaria*, gathered 8th July 1899, so really developed in June. Dr. Hincks mentions gathering these in June and October in other parts of England.

Crisia eburnea L. On *Flustra foliacea* and *Hydrallmania*.

Crisia denticulata Lam. On *Hydrallmania*.

HYDROZOA.

Coryne pusilla Gærtner. On *Hydrallmania* and *Laminaria*.

Obelia geniculata L. On *Flustra securifrons*, *Laminaria*, *Maugeria* in quantity, and the unknown red weed.

Sertularia gracilis Hassal. On *Hydrallmania* and *S. operculata*.

Sertularia operculata L. On root-stock of *Laminaria* with capsules, and frequently alone—i.e., unattached. At the base of one such piece was a bit of the Sponge *Halichondria panicea* Johnst.

Sertularia argentea E.&S. On a small red weed growing on stalk of *Laminaria*.

Hydrallmania falcata L. Seemingly the commonest species at Whitby.

Dr. Hincks gives, as found by him at Whitby—

Buskia nitens Alder, B.M.P., I., 532-3.

Syncoryne eximia All., 'Brit. Hyd. Zooph.,' p. 52.

Clavatelia prolifera Hincks, p. 75.

Bimeria vesita T. S. Wright, p. 104.

Cuspidella humilis Hincks, p. 210.

Cuspidella costata Hincks, p. 211.

Diphasia attenuata Hincks, p. 248.

A few species are given as 'Yorkshire coast.'

NOTE—FISHES.

Large Pike near Horncastle.—I do not know whether you record piscatorial takes, but the recent floods would seem to have brought down from our upper mill-pools some large fish. That indefatigable angler, Mr. W. Bryant, of Horncastle, landed a 13-lb. Pike (*Esox lucius*) a few days ago, taken in the canal near the town. A day or two after Mr. Bryant's capture, his son, aged 14, succeeded, although with tackle unsuitably fine, in landing, after a hard fight, a second good Pike, weighing 10¼ lbs.; and since that a Pike of 15 lbs. has been taken near Boston in the river Witham, into which the above canal debouches. I note that in December last a Pike of 13 lbs. weight was taken in the river Witham, near Lincoln, which, on being landed, disgorged another Pike about 2 lbs. in weight. I have known the loch Trout do this in Scotland.—J. Conway Walter, Langton Rectory, Horncastle, 10th March 1900.

Naturalist,

NATURALISTS AT NEWARK.

Rev. EDWARD ADRIAN WOODRUFFE-PEACOCK, L.Th., F.L.S., F.G.S.,
Vicar of Cadney; Organising and Botanical Secretary, Lincolnshire Naturalists' Union.

On Thursday, 29th June 1899, a joint meeting of the Lincolnshire Naturalists' Union and the Nottingham Naturalists' Society was held at Newark, to study Langford Moor Wood in Notts. and Stapleford Wood and Moor in Lincs. It is in reality one moor and woodland divided by a wide ditch or drain, which has been planted by man, the sandy, gravelly soil being unpropitious for the growth of forest trees. The weather was very threatening, but fortunately continued fair, and the outing was much enjoyed. Among the party assembled at the Robin Hood Hotel were:—Messrs. W. Armitage, W. Bradshaw, Prof. J. W. Carr, M.A., F.L.S., John Golding, W. H. Pratt, F. Rayner, W. E. Ryles, J. Shipman, F.G.S. (Nottingham), the Rev. A. Thornley, F.L.S. (Leverton), the Rev. W. Fowler (Liversedge), Mr. F. M. Burton, F.G.S. (Gainsborough), the Rev. S. E. Wood (Great Ponton), Mr. A. E. Wherry (Bourne), Mr. E. A. Merryweather (Southwell), Miss Paterson (Grantham), Mr. H. Preston, F.G.S. (Grantham), Mr. J. Sneath (Lincoln), Mr. and Mrs. Rowle (Grantham), the Rev. W. C. Macklin (Gloucester), Miss S. C. Stow and Mr. and Miss Stow (Caythorpe), Mr. Lewington (Market Rasen), Mr. Bliss, Mr. Brooks (Newark). Leaving the Robin Hood Hotel in two brakes the party went first to the Beacon Hill, where they were shown through the brickyard, and thence into Mr. Wardley's garden to inspect the gypsum pit, where one of the finest sections of the Keuper Marls in the midland counties is to be seen, with the Rhœtic Beds well shown on the top. Mr. H. Preston, by request, gave the following short address on the Keuper Marl: The red marls, with their bands of gypsum, so well seen in this pit, are of great geological interest, particularly in relation to their ancient history. Generally speaking, the interest of a rock formation lies in the fossils it contains, these being the medals which tell of the 'Fauna and Flora' which existed in the bygone ages. But at times there are other contents besides fossils and other phases of rock formation which speak with equal eloquence of their past history, and which give to us the physiography of the ancient lands and seas; and it is to some of these we may for a moment or two turn our attention in connection with these local rocks. It is from these marls that our

principal supply of rock salt and gypsum is obtained, hence they are often known as the salt-bearing rocks. They occupy the upper division of the New Red Sandstones or Triassic system. To a non-geologist this explains nothing. It may be better, therefore, if I ask you to let your minds travel back through ages and ages to a time when this England of ours formed part of a large continent, in which were great rainless plains and extensive salt and bitter lakes. It was in these lakes that the red marls, the salt, and gypsum were deposited. We have in the Dead Sea at the present time a very good example of a salt lake, similar in character to those of the Triassic period. Here the Jordan and other streams, bringing down large quantities of dissolved matter, pour their waters into the Dead Sea. Evaporation takes place from the surface so rapidly that none of the water escapes in any other manner. The salts accumulate until their point of saturation is reached, and are then precipitated, unless they are previously thrown down by chemical reaction. Of course, the least soluble salt is thrown down first, and the more and more soluble as the volume of water decreases. Now, taking the two principal salts found in these marls, viz., gypsum, or sulphate of lime, and rock salt, it is found that gypsum is precipitated from a solution much earlier than rock salt; in fact, if we take sea water as a typical example it is necessary to only evaporate 37 per cent. of the water before gypsum is precipitated; before common salt was precipitated it would be necessary to evaporate 93 per cent. of the water. So that in these salt lakes, whether ancient or modern, if ordinary evaporation and concentration went on we should find first a layer of gypsum, then a layer of rock salt, and this is often found to be the case in the salt districts. Where we have, as in this case, only gypsum, it may be due to the point of saturation of rock salt never having been reached, or to the salt having subsequently been dissolved away. In parts of the Dead Sea which have at times been exposed the mud is found to be full of crystals of common salt and gypsum, and we have abundant proof that similar crystals formed in the mud of this old Keuper Lake. Here is a small slab of the marl from a pit a few miles distant, and on it you will be able to see great numbers of cubic crystals of mud, which were originally crystals of common salt, but percolating water has subsequently dissolved away the salt and filled up the spaces with particles of mud, hence we get these pseudomorphs of rock salt. You will easily understand that in such concentrated solutions as we find in these dead

seas, it would be impossible for any life to exist, and consequently it is very rare indeed that any fossils are found in these marls. What are found generally relate to animals which crawled or walked along the soft muddy shores of the lakes, and left their trails and footprints to be baked by the sun's heat. I have here the footprint of an animal called the Labyrinthodon, also shales showing worm and other tracks which were made on these ancient shores. Besides these, you may notice one piece showing the impressions made by the raindrops of a passing shower. Just one other thought before we leave this pit. The level of the Dead Sea is nearly a quarter of a mile below the level of the Mediterranean, and its waters are too salt for any life to exist in them. Now I want you to imagine that the barrier separating these two waters is removed; the waters and living contents of the Mediterranean would be poured into the Dead Sea and tend to establish a level. But the living creatures which first came over would be immediately killed by the salt waters of the Dead Sea, and their bones spread over the bottom. These would be buried in the accumulating mud, and, being preserved in a fossil state, would form what geologists term a Bone Bed. Now this is just a picture of what took place at the close of this Keuper period. The barrier between the salt lake and the outside ocean was removed, and Bone Beds were formed. The low escarpments which we see to the eastwards indicate the position of the Rhœtic Beds. These are passage beds formed during the change which took place in the ancient lakes before the waters became suitable for the ordinary marine life to exist and multiply. I have here a section of the Rhœtic Beds at Westbury-on-Severn, where they are most fully developed, and you will see two interesting Bone Beds marked, each about one inch thick. These beds are in places almost entirely made up of fossil bones, teeth, scales, and coprolites. When the period of change had completely passed away, and the waters had become as ordinary marine water, then we begin to get the great clay deposits of the Liassic formation. But we will leave this most interesting formation as being perhaps just a little beyond the present local geology.

After Mr. J. Shipman, F.G.S., had added a few weighty and incisive words to drive home important points, various diagrams and specimens of fossil footprints, worm tracks, pseudomorph crystals of rock salt, etc., obtained from the new red sandstones, were exhibited in illustration of the remarks which had been made on the past history of these rocks. The party afterwards

drove on to the woodland and moor, and worked the Nottinghamshire and Lincolnshire portions in turn. The various sections of entomologists and botanists had a very busy and interesting afternoon amongst the insects and plants. Returning to the Robin Hood Hotel at 5.30 p.m., the party sat down to an excellent tea, after which an informal meeting was held, under the presidency of the Rev. William Fowler (President of the Lincolnshire Society), when accounts of the work done were given by the leading specialists.

The President said they had had a very enjoyable day. The botanists had been in rather low water, but they were not selfish, and were very glad to hear that the entomologists had had a good time, and had made several captures. They were very pleased to have been joined by the Nottinghamshire Society. They had met on the borders of the two counties, and it was a very great advantage for them to have assembled together in this way. He thought in future there should be many more meetings in common, for when naturalists met together, from whatever quarter, they were sure to do one another good and to encourage each other. They would be glad now to hear what had been done during the afternoon.

Mr. F. M. Burton, F.G.S., then made some interesting observations on the gravel beds on which the Stapleford Woods are situated, and referred to the ancient Trent when it flowed through the gorge at Lincoln. He said when he spoke about the Lincoln Gap he felt an apology was due from him, for he had, when he was President of their Lincolnshire Union, introduced the subject to their notice. He had not the slightest doubt that that Great Lincolnshire Gap was formed originally by the Trent flowing through it. The Trent, and possibly other rivers, were the cause of the excavations. When that gap was being excavated the whole of the land between the cliffs and the opposite hills of Nottinghamshire, and beyond into Derbyshire, was all high land—much higher than it was now. Water could not, of course, run up hill, but it began to cut slowly through the cliff until it was hollowed out. The soft clays on the west side were all worn through, and the Trent flowed steadily on until at last it cut the gap still lower and lower almost to the level of the plain. There had been, meanwhile, another great river at work—the Humber. The Humber was dominant at that time, and it was the dominant river now. It came cutting through the softer strata until it tapped the Trent. The Trent was drawn off and turned round, and instead of going through

the gap any longer, it went down the side of the valley into the Humber. The whole of these gravels which were scattered about this part of the country were, therefore, simply the effect of river drainage. There was not the slightest doubt that the Trent, the Brant, the Witham, and the whole of that river system had left its remains in these wonderful beds of gravel. It was a most interesting subject, and they were much indebted to Mr. Preston for the able address he had given them.

Professor J. W. Carr was invited to make some observations. He said there was very little to do in his own particular line, and therefore he turned his attention almost exclusively to entomology, and assisted his friend Mr. Thornley in the healthy pastime of catching 'bugs.' He should like, therefore, to say a few words of a general nature, and, in the first place, he was extremely glad that they had had an opportunity of meeting their fellow-naturalists of Lincolnshire. He thought that the example which had been set by the Lincolnshire Society of inviting them to join in their outings was one that ought to be repeated. Nothing assisted field work—which was one of the most important objects of the existence of these societies—to a greater extent than for naturalists of the different districts to meet together and exchange ideas in the way they had that day. Work such as theirs was extremely valuable, and might be very greatly extended, not merely to trace out the distribution of animals and plants in their own particular areas so as to lead to the explanation of many interesting problems on the distribution of species, but they might also, to a great extent, carry their work further, and endeavour to create an interest in natural history studies among people who were not connected with them. It was astonishing what ignorance there was amongst the great mass of the people on natural history subjects of all kinds. He might be allowed to mention incidents which had come under his own notice that week. During the first three days of the week he had been examining the students in a certain institution, and he was surprised at the want of knowledge some boys displayed in matters in which they would think boys ought to be fairly proficient. One of the questions he set was to define an insect, and to give some account of its structure, life history, and metamorphoses. One student took as an example a moth, or butterfly, and his paper ran as nearly as possible in these words: 'The butterfly first lays its eggs, and the eggs grow up into crystals, which are contained in a sort of cobweb. After a time the crystals come to life, and are

developed into caterpillars. Caterpillars feed on green leaves for three or four weeks, and then turn into the butterfly, or moth, which lives for 24 hours.' It was almost inconceivable that any boy should show such confusion and inaccuracy of ideas. He could only say on behalf of his brother members of the Nottinghamshire Society that they had enjoyed their day immensely, and it had enlarged their ideas and sympathies and extended their knowledge of the local fauna, if not the flora. Several of the members had made rather important captures, and he hoped that before many years were over they would be able to publish exhaustive accounts in 'The Naturalist' of the fauna and flora of the county, which would fill up a great gap in their knowledge of the plants and animals of the midland counties. He himself had the flora in hand, and had collected an enormous amount of material, while Mr. Thornley and others had an equally extensive mass of material relating to the fauna, so that he hoped in time Nottinghamshire would be as well described as any other county in the kingdom.

The Rev. A. Thornley, F.L.S., President of the Nottinghamshire Society, confirmed what Professor Carr had said as to the pleasure which the meeting had given them. They were working very hard at the fauna, and some of them would probably have noticed, through the kindness of many of his friends, he had been able to publish a valuable list of the Saw Flies of the two counties. That list contained four or five entirely new species; some new to science, and a number new to Great Britain. That was not a bad beginning, but one man could not do all this work. He hoped the members would do their best to supply material to work upon. He was glad to say he had at home now six or eight parcels which contained some hundreds of beetles, grasshoppers, and all sorts of pretty things that crept and crawled. It was his delight when he got ten minutes to spare to set to work upon them. He had been fortunate in receiving the hearty and welcome assistance of our great experts, and he trusted that all who could assist would do so. Their object was to work up thoroughly the natural history, botany, geology, fauna, and flora of their own county. Mr. Thornley went on to describe some of the flies and beetles which had been captured during the afternoon, and Mr. Lewington followed with a list of the specimens he had also observed.

The following Entomological Reports are for Langford Moor, Nottinghamshire, only.

Professor J. W. Carr, F.L.S., reported that the only Lepidoptera of note seen by him were:—

Thecla rubi L.
Hesperia sylvanus Esp.
Macroglossa stellatarum L.
Macroglossa fuciformis L.

The Rev. A. Thornley thus:—In every way the district seems a specially good one, but would work better a little earlier.

DIPTERA.

Dioctria rufipes.
Leptogaster cylindricus.
Volucella bombylans.
Volucella pellucens.
Xylota sylvarum.
Xylota segnis.
Empis tesselata.
Empis livida.
Chrysops cæcutiens.
Neoitamus cyanurus.

HEMIPTERA.

Lopus gothicus. Two.
Cyllocoris histrionicus.
Acanthosoma interstinctum.
Myrmus myriformis (nymph).
Leptoterna dolobrata.
Lygus contaminatus.
Nabis rugosus.
Psallus betuleti.
Aphrophora alni.
Cixius nervosus.

COLEOPTERA (a selection).

Cicindela campestris.
Anaitis ocellata.
Dolopius marginatus.
Deporäus megacephalus.
Deporäus betulæ.
Rhynchites nana.
Cryptocephalus coryli.
Cryptocephalus labiatus.
Brachytarsus varius.
Throscus dermestoides.
Ragonycha pallida.
Malthinus punctatus.
Malthinus fasciatus.
Anoplus plantaris.
Exochomus bipustulatus.
Phyllopertha horticola.
Tychius meliloti (Newark, in the quarry).

NEUROPTERA.

Platetrum depressum.
Hemerobius sp. common on firs.

HYMENOPTERA.

SAW FLIES.

Tenthredo solitaria.
Rhogogastera viridis.
Emphytus calceatus (Klug).
Athalia rosæ.

ACULEATES.

Ammophila sabulosa.
Priocnemis exaltatus. ♀.
Crabro peltarius. Three ♀s.
Andrena cineraria.
Andrena analis.
Nomada ruficornis.
Cœlioxys elongata.
Bombus hortorum.
Odynerus parietum (Newark).

The following Aculeates were taken by Prof. J. W. Carr at Langford Moor on a subsequent visit (12th August).

Sphecodes gibbus.
Sphecodes subquadratus.
Andrena albicrus.
Crabro quadrimaculatus.
Nomada solidaginis.
Halictus quadrinotatus.
Halictus cylindricus.
Epeolus productus.

The Rev. W. Fowler reported as follows:—'This is my list not much, the wood was too dry but as you are an adept at 'makin' summat out o' nowt' it will just suit you.'

Fungi.	Lichens.
Amanita rubescens.	Parmelia physodes.
Boletus flavus.	Peltigera canina.
Boletus subtomentosus. A very fine specimen collected by Miss Stow.	Cladonia pyxidata.

These were found in Lincolnshire. I am always glad to do anything for a friend like Mr. Fowler.

Of Flowering Plants about 160 were observed. These were the best:—*Polygala vulgaris*, blue and red, with one patch of white, in Nottinghamshire; *Montia fontana*, *Hypericum pulchrum*, *Filago minima*, in Nottinghamshire; *Scleranthus annuus*, abundant in cornfield and on moor; *Agrostis palustris*, *aristata* Sinclair, was very fine on moor.

The Mosses recorded by Miss S. C. Stow were thirty species. The following were new to South Lincolnshire at the time:—

Polytrichum piliferum Schreb.	Aulacomnium palustre Schwg.
Campylopus flexuosus Brid.	Plagiothecium undulatum B.&S.

The rest have gone into the Register. I have to thank Miss Stow, Prof. Carr, and Mr. Preston for much help in making out full reports for our Registers.

NOTE—BOTANY.

Bee Orchis at Scarborough and near Micklefield.—In Mr. F. Arnold Lees' article, 'An Old Leeds Herbary,' there is one item which has interested me very much. He says, 'Fifty years ago (1836) the Bee Orchis grew at Scarcroft . . . now of a surety relegated for ever to farther fields.' The Bee Orchis (*Ophrys apifera*) is a favourite of mine, and I have very pleasant recollections of rambles with an old friend of mine, Walter James Fletcher, some years ago a member of the Leeds Club, searching for the plant. We were staying at Scarborough at the time, and a specimen was on view in the Museum, labelled 'Forge Valley,' and we determined to lose no time in trying to find it. We spent the best part of a week 'looking,' including in our rambles 'Bee Dale,' a most beautiful spot, finding many things, but not the one. We had given the job up, and on the last day in the week were in Forge Valley with some friends, when my friend called out he had found *Cyclostoma elegans*, a weathered specimen, and as he was interested in conchology we began to search for living specimens. The place looked like a quarry, all stony, with no grass or shrubs near, and in this barren spot was our long-looked-for gem, the Bee Orchis. I think had anyone seen us there, two sober individuals, dancing like cannibals round the plant, they would have thought us mad. It seemed such a treasure that we hardly dared pluck it. There were twelve altogether; we only took three, one each and one to send to a friend on the *Leeds Mercury*. You will be asking what this has to do with the Leeds Herbary. Well, I am coming to it. Last year (1899) I had been with some friends to Hook Moor and was taking a near cut through the coal-yards between Micklefield and Garforth, and came across my old friend the Bee Orchis, and I thought it might interest Mr. Lees to hear that it was still to be found so near Leeds. Should any Leeds naturalist find it, and it seems only to be found where other flowers are not, remember this, leave it, and let it tell its own story of what was.—J. Waddington, 38, Leicester Grove, Leeds, 24th March 1900.

[We re-echo Mr. Waddington's closing sentence.—Eds. Nat.]

NORTH LANCASHIRE VARIETIES OF *POLYPODIUM VULGARE*: THE STORY OF A FAILURE.

S. LISTER PETTY.
Ulverston, North Lancashire.

[The following was written in December 1897. I have re-examined the material, and although some of it is poor, yet I think the naming right. It stands, therefore, as originally written. After the date mentioned—1884-5—I raised hundreds of plants of *Scolopendrium* and *Polypodium*, and these, as a rule, proved the multiple parentage. Lowe's last book, 'Fern Growing,' 1895, is on my shelves.—December 1899.]

In 1884-5 much of the year was passed in North Lancashire (I then resided in Yorkshire), and the theory of multiple parentage of fern varieties was known to me, that is, I was to some extent aware of the experiments of Mr. E. J. Lowe and Colonel Jones in the subject. As I was too ignorant to prove the matter impossible, and my own feeling being in favour of the theory, I tried if amongst the thousands of wild polypodies which grew in the district the multiple parentage could be traced in the wild varieties. More than this, was environment (a troublesome way people then had of getting over difficulties) a factor in the variation, and had aspect anything to do with it?

Many gardeners think that ferns growing in a west or south-west aspect are more liable to 'sport' than in, say, east; in consequence better seedlings should be produced in such situations. Now, could this apply to the wild native? The choice of the polypody was determined by the fact that the fronds rise from a rhizome and not from a caudex, and the face or front of the frond is generally, but not invariably, influenced by the direction from which the light reaches it, i.e., it is more likely to face the light than otherwise, but from experience I won't insist upon this, although it is generally so. Out of hundreds of observations, compass in hand, I must own that there is very little reliable material on which to strike an average, but the story of the failure may be interesting to some. A representative frond was chosen from a plant, the aspect taken of the majority of the fronds; the frond was then gathered and numbered, and the number booked with locality and aspect. From this collection of several hundred fronds one hundred were selected with regard only to variation, fairly good speci-

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mens, some very good. The numbers were then looked up and a census taken. Unfortunately the working out proves nothing: 22 came out S.S.E., the next being 17 West, the lowest S. and S.W. with one each. All the points of the compass were there —it had been boxed! The consolation of possessing so many specimens was little against the hope of proving something. No specimens were gathered in deep shade. By the end of 1886 other matters interested me more, and the wild polypodies and the theory were matters of the past. Unfortunately many of the best specimens were given away or used for seed, especially *crenatum* and *cornutum*, and their places in the one hundred taken by, in some cases, wretched fronds. I am not quite sure that I took the best method of procedure, but it seemed the simplest, and that usually is the better way.

The list below contains what I collected in the neighbourhood of Broughton-in-Furness, Woodland, and a few over the Duddon in S.W. Cumberland. What has been chronicled previously which I can find in print are given first, but there must be more, for out of the large number of people interested in fern varieties, some certainly print lists of what they have gathered in North Lancashire. The number of named varieties is somewhere about 90, but many of these are true gardeners' raisings and not wild.

1859. Moore and Bradbury. Nat. Print. Ferns (8vo ed.), I. 68. Var. *semilacerum* Link. Ulverston, Miss E. Hodgson; and repeated 1865. Lowe, Native Ferns, I. 28. He also gives *Acutum Stansfieldii* Lowe, near Cark, Stansfield; and *variegatum* Barnes, near Cark, Stansfield.

1869. Aspland's Guide to Grange, 108. Anthony Mason gives the following varieties, without authorities or localities:— *acutum*, *coriaceo-bifidum*, *cristatum*, *interruptum*, *lobatum*, *obtusum*, *pulcherrimum*, *serratum*.

1872. Linton's Ferns, ed. 2, by J. M. Barnes, pp. 22-23, has a tabular statement including both N. Lancs. and Westmorland.

acuto-bifidum Wollaston. Stainton, 1858, J. M. Barnes.

auritum Moore. No locality or finder; 'rather common.'

bifidum Francis. No locality or finder; 'rather common.'

bifido-multifidum Mapp. Near Grange, 1869. Found by a boy.

crenatum Moore. No locality or finder.

curtum Wollaston. Crake Valley, 1870, J. K. Hodgson.

dentatum Monkm. No locality or finder.

dentatum Barnesii Moore. Slackhead, 1865, Barnes.

grandiceps Barnes. Near Grange, 1868. No finder.

irregulare Moore. Cartmell Fell, 1864. Barnes.

semilacerum Link. 'Several places; a fine limestone form.'

serra Wollaston. Furness Fell, 1868, J. A. Wilson.

serratum Moore. No locality or finder.

suprasoriferum Wollaston. Cartmel Fell, 1868, Barnes.

From my gatherings.

auritum Moore. My specimens not so decided as some gathered in Devonshire in 1886. Taken in several localities, the four best (No.) 63 S.S.E., 107 S.S.W., 131 and 139 both N.N.W., and from different localities quite a mile apart.

bifidum Moore. Gathered once on a high bank under bushes, May and June 1884, S.S.E., and there are several small forms which seem as if tending towards *cristatum*, but are not really that. Some fine specimens in Duddon Woods, S.W. Cumberland, not gathered.

crenatum Moore. This form not quite typical, found on a wall, facing W., 154; and after two years of cultivation ran into a poor *serratum*. The summer of 1887 (in which I was much from home) killed it.

cornutum Moore. Found on same wall as last and same aspect. 154 B. I have grown the variety ever since 1885, and it is fairly constant, sometimes exhibiting a tendency towards *crenatum* and *dentatum*. Mr. Baker, to whom a plant was sent, said it was the *cornutum* Moore, but some of the variety men of to-day may not call it so. First found, I believe, at Arnside by Crossfield in 1865.

cristatum (? Perry). The late John Ball, of Grange (the great friend of Anthony Mason) gave me a small plant of this in 1893, and told me it had been gathered near Grange.

dentatum Monkman. (154 A.) Same wall and aspect as *crenatum*, and again not quite typical. Length of frond, including stipes, 11¾ in., breadth 4¼ in.

? foliosum Wollaston. I think 146 (same wall and aspect) may be referred to this, although I have not seen a properly vouched specimen of *foliosum*. Length, stipes 3¼ in., frond 9¼ in., breadth 5 in.

With these four—*crenatum*, *cornutum*, *dentatum*, and ? *foliosum*—is a form resembling very poor

semilacerum Link (154 C). Length of frond and stipes 8¼ in. This was the only locality in which I could trace any proof of crossing. Evidently on this wall the plants had grown and seeded for many years, for the Polypody is not a rapid grower, and the rhizomes were well attached to the stones and mortar and earth between. If the variation was not the effect of crossing, how is it to be explained? The fact that the forms occasionally (especially in *crenatum* and *dentatum*) run into each other or revert, works for and not against. The space covered was about 15 ft. by 5 ft., the aspect due west. Next comes another failure. A wandering 'collector' for the market happened to pass the locality and cleared the lot! Then the owner of the wall saw it wanted patching here and there, and of course patched. By the help of an acquaintance I got even with the 'collector.' The railway company looked carefully after his hamper, and it was discovered that in some way he was contravening the regulations, and had to pay on a higher scale; but this was small consolation to me, as the polypodies were gone long before the man was known. The heavier cost was paid at once, and the pest, after relieving his mind, disappeared. The locality when I saw it last, five years ago, was only just beginning to recover.

interruptum Moore. Several specimens; one, 111, is almost a replica of the illustration in Lowe (fig. 19, p. 39), aspect W.; 144, a smaller one, with the short bifid lobes crossing each other N.W. In 81 the specimen I have is bifid at apex, the only one that was so on the plant; a tall form, 16 in., stipes 4¼ in., frond averaging about 3 in. broad; S.S.W.

irregulare Moore. To this I put the most curious specimen I have. When growing on the top of a wall I hardly knew what to make of it, and at first, looking at it from below and a few yards away, took it as some form of *marginatum*. It turned out that the crisped appearance was not due to this, but to the cutting and waving of the sides of the lobes. There were several fronds on the plant, each with the stipes split about half an inch above the rhizome; above the fork 1½ in. of stipes and 3½ in. of frond. Part of the plant was taken, and it grew well until the hot summer of 1887, when it reverted to a small *serratum* and died in 1889 or 1890. My book says 'No. 2/84. Wall top on Ulpha Road, fronds with different aspects, so not noted, growing alone, barren, August 1884.'

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Another (125), 9 in. altogether, thin in texture, lobes not cut or divided, but unequal in size, the longest lobe on each side placed about a third of distance from apex. S.E.

Another (136) has broad lobes, averaging ½ in. across, some of them are bifid, some shortened, others narrowed and serrulate towards the point. North.

[***lobatum*** Sidebotham. Seen in S.W. Cumberland, Duddon Woods; not gathered.]

[***multifidum*** Moore. Three plants on a wall near the lodge of Duddon Hall. Two of the plants taken to cultivate; both dead, after losing their characters.]

obtusum Stansfield. 183. Length of frond, including stipes, 10 in. E.S.E. I have five specimens, three inclining to E., one to W. The smallest (117) 5 in. long and 2 in. broad; the longest found on plant. N.N.E.

There are no specimens of true *serratum* Moore amongst mine, but one (148) is serrate on upper half of frond.

serrulato-bifidum Monkm. 59 S.S.E., 127 N.W., are the best; not a scarce form, I should think, in shady places.

variegatum Barnes. Two plants on the Knott, Broughton-in-Furness. One taken (54), but proved inconstant in cultivation. W.N.W.

There was a tendency in several cases in the lobes to run together, i.e., to be confluent; of these I have a small series.

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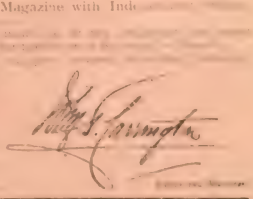

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CAPITALISATION OF SPECIFIC NAMES.—Hitherto the rule of 'The Naturalist' has been the Zoological one, that specific names shall invariably commence with a small letter, never with capitals. Henceforth, this rule will still apply to all Zoological names, but in deference to the wishes of our botanical contributors the specific names of plants will conform in this respect to the standard catalogue or monograph in each branch of botany.

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Nature Notes, Vol. 11, No. 124, for April 1900. [Selborne Society, London.
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North Lonsdale Magazine, Vol. 3, No. 11, February 1900. [Mr. S. Lister Petty.
Geological Magazine, No. 429, for March 1900. [Purchased.

Undersigned would be glad to exchange **Geological Specimens** with a Geologist living in the Midland or Northern Counties.—C. CASEY, Kelston, The Quarries, Swanage, Dorset.

Another (125), 9 in. altogether, thin in texture, lobes not cut or divided, but unequal in size, the longest lobe on each side placed about a third of distance from apex. S.E.

Another (136) has broad lobes, averaging ½ in. across, some of them are bifid, some shortened, others narrowed and serrulate towards the point. North.

[***lobatum*** Sidebotham. Seen in S.W. Cumberland, Duddon Woods; not gathered.]

[***multifidum*** Moore. Three plants on a wall near the lodge of Duddon Hall. Two of the plants taken to cultivate; both dead, after losing their characters.]

obtusum Stansfield. 183. Length of frond, including stipes, 10 in. E.S.E. I have five specimens, three inclining to E., one to W. The smallest (117) 5 in. long and 2 in. broad; the longest found on plant. N.N.E.

There are no specimens of true *serratum* Moore amongst mine, but one (148) is serrate on upper half of frond.

serrulato-bifidum Monkm. 59 S.S.E., 127 N.W., are the best; not a scarce form, I should think, in shady places.

variegatum Barnes. Two plants on the Knott, Broughton-in-Furness. One taken (54), but proved inconstant in cultivation. W.N.W.

There was a tendency in several cases in the lobes to run together, i.e., to be confluent; of these I have a small series.

NOTE—FISHES.

Large Pike at Burton Constable, Yorks. S.E.—Seeing the record of a large Pike (*Esox lucius*) being caught in Lincolnshire, I thought I would record the capture of what I believe to be one of the heaviest Pike ever caught in Yorkshire. It weighed 29½ lbs., and was caught on a spoon-bait in October last, in the lake at Burton Constable, by Mr. Councillor Cooper, of Hull, who has had it preserved.—J. R. LOWTHER, Crane Hill, Beverley, 4th April 1900.

NOTES—COLEOPTERA.

***Oxypoda nigrina* near Saltburn: an Addition to the Yorkshire Coleoptera.**—Numbers of beetles may often be found at the foot of sea-banks on the coast after a land wind. In April last year I took *Oxypoda nigrina* Wat. at Saltburn in this situation. It is one of the smaller species, and does not appear in the list of Yorkshire Staphylinidæ.—M. LAWSON THOMPSON, 35, Leven Street, Saltburn-by-the-Sea, 11th April 1900.

Beetles at Cadney, near Brigg.—I give a short selection from a long list of Coleoptera, named by Rev. A. Thornley, collected in Cadney during February and March 1900:—*Pterostichus oblongopunctatus* (seventeen examples), *Calathus piceus*, *Blechrus maurus*, *Dacne humeralis*, *Subcoccinella 24-punctata*. The last was taken on the 19th of February. E. ADRIAN WOODRUFFE-PEACOCK, Cadney, Brigg, 14th April 1900.

THE MORTIMER MUSEUM AT DRIFFIELD.

A QUESTION of the highest possible importance is now pending in East Yorkshire. This is the future of the valuable museum which Mr. J. R. Mortimer has formed at Driffield. As a local collection it is invaluable, including as it does the results of Mr. Mortimer's life labours in investigating the tumuli of the Yorkshire wolds, and if once dispersed the loss to science will be most deplorable and irreparable.

It is well known to anthropologists and geologists that these collections are of the greatest scientific utility and value, and the fact that they are strictly local objects adds immeasurably to their scientific importance.

There can therefore be no question that the collections should be kept together and intact, and retained in the district; and it is to be hoped that the County Council of the East Riding of Yorkshire will rise to the occasion and secure now, for the moderate price which Mr. Mortimer asks, a treasure which—should they wish to secure it in future years—will be absolutely unattainable in any way. There are numerous reasons why these fine collections should be retained in the district. For one thing the collection is strictly local; Mr. Mortimer has not suffered his East Riding collection to be overshadowed by foreign material or relics of any kind. For another thing, the collections are already properly housed and cared for, and it would not be a very great matter for an important public body like the County Council to see to its permanent future maintenance.

Were such a collection in any Continental city, it is tolerably certain that local and even national subventions would speedily be found. We hope the present appeal to the East Riding will be crowned with success, and that Mr. Mortimer may be able to realise that his life's work has not been in vain.

BOOK NOTICE.

The **Annual Report** of the **Barrow Naturalists' Field Club** and Literary and Scientific Association for the 22nd year ended 25th March 1898—which forms Vol. 13—is a record of some excellent work, the principal and most important paper being the one by Mr. W. B. Kendall, A.M.Inst.C.E., on 'Northscale: the History of a Furness Village,' which is illustrated by a valuable plan of the ancient common fields. The activity of the Society is well shown by the reports of excursions, and the reprint of the Wild Birds Protection Order for the Borough, which includes Walney Island, is useful for reference. The frontispiece is a portrait of the President, Mr. W. A. Holmes.

BIRDS IN A RIPON CITY GARDEN.

Major HORACE C. ST. PAUL, J.P.,
The Willows, Ripon.

The following is a list of wild birds, 76 in number, which I myself have seen in my garden during the last ten years. It also includes, as far as I have been able to ascertain, the birds that nest here. I have seen one or two species the names of which I did not know. My house and garden are on the banks of the river Skell, and beyond and joining it is a small but long plantation with a stream running through it, which always in winter is the resort of Woodcock and Snipe. The banks of the river are thick with Willows, therefore there is variety of cover and food for all kinds of birds, and they evidently appreciate it Moreover, I am fortunate in having a near neighbour who is also a member of the Yorkshire Naturalists' Union, and who is as fond as I am of the feathered tribes.

Few people can realise, when they hear the chorus of sweet songsters in the spring, and are shown innumerable nests in almost every tree, that from my garden to the Ripon Market Cross is not ten minutes' walk.

A few years ago Bullfinches, Redpolls, and flocks of Goldfinches we saw constantly, but alas, the bird-catcher—one of the curses of a country town—is busy here, as everywhere, and does his best, in spite of all my efforts, to rob us of our rarer feathered songsters.

All the winter the Water Ouzels sing and disport themselves on the stepping-stones below my windows, and Waterhens are up and down the stream constantly, or are feeding on the bank in front of my house. Unfortunately there are not as many Kingfishers as formerly, but at least a pair I see often flashing up and down. It was in the very hard winter of 1886 that I saw Grouse in the garden, no doubt driven off the moors (not eight miles off) by the severity of the weather. Many other birds have sought shelter here from the same reason, that of course do not stay with us.

List of Birds Seen in the Garden at the Willows, Ripon.

The 37 marked * have nested.

*Blackbird (*Turdus merula*).
*Thrush (*Turdus musicus*).
*Common Sparrow (*Passer domesticus*).
*Hedge Sparrow (*Accentor modularis*).
*Wren (*Troglodytes troglodytes*).
*Willow Wren (*Phylloscopus trochilus*).
*Robin (*Erithacus rubecula*).

1900 May 1.

Goldfinch (*Carduelis carduelis*).
*Bullfinch (*Pyrrhula pyrrhula*).
*Chaffinch (*Fringilla cælebs*).
Snipe (*Gallinago gallinago*).
Woodcock (*Scolopax rusticola*).
10th April 1888. Saw two Woodcocks in the garden.
Green Plover (*Vanellus vanellus*).
*Missel Thrush (*Turdus viscivorus*).
Water Ouzel (*Cinclus cinclus*).
*Sandpiper (*Tringoïdes hypoleucos*).
Sand Martin (*Cotile riparia*).
*Swallow (*Hirundo rustica*).
Swift (*Cypselus apus*).
Magpie (*Pica pica*).
*Partridge (*Perdix perdix*).
*Pheasant (*Phasianus colchicus*).
*Yellowhammer (*Emberiza citrinella*).
Long-tailed Tit (*Acredula rosea*).
*Blue Cap (*Parus cæruleus*).
*Blackcap (*Sylvia atricapilla*).
Golden-crested Wren (*Regulus regulus*).
*Flycatcher (*Muscicapa grisola*).
*Chiffchaff (*Phylloscopus rufus*).
*Whitethroat (*Sylvia sylvia*).
Kingfisher (*Alcedo ispida*).
25th September 1886. Saw four Kingfishers together in front of the house.
*Starling (*Sturnus vulgaris*).
Wild Duck (*Anas boschas*).
Wigeon (*Mareca penelope*).
Sparrow-hawk (*Accipiter nisus*).
*Wood Pigeon (*Columba palumbus*).
*Cuckoo (*Cuculus canorus*).
Crow (*Corvus corone*).
Grey Crow (*Corvus cornix*).
*Waterhen (*Gallinula chloropus*).
Little Diver (*Tachybaptes fluviatilis*).
*Sedge Warbler (*Acrocephalus phragmitis*).
*Reed Bunting (*Emberiza schœniclus*).
*Green Linnet (*Ligurinus chloris*).
*Brown Linnet (*Linota cannabina*).
*Redstart (*Ruticilla phœnicurus*).
Jackdaw (*Corvus monedula*).
Tree Creeper (*Certhia familiaris*).
Nuthatch (*Sitta cæsia*).
Golden Plover (*Charadrius pluvialis*).
*Corncrake (*Crex crex*).
*Pied Wagtail (*Motacilla lugubris*).
*Green Wagtail (*Motacilla raii*).
Green Woodpecker (*Gecinus viridis*).
*Ground Lark (*Anthus pratensis*).
*Lesser Redpoll (*Linota rufescens*).
*Lark (*Alauda arvensis*).
Heron (*Ardea cinerea*).
Water-Rail (*Rallus aquaticus*).
Redwing (*Turdus iliacus*).
Fieldfare (*Turdus pilaris*).
Grouse (*Lagopus scoticus*).
6th February 1886.
Stone Chat (*Saxicola œnanthe*).
Seagulls (two) in the garden for several days, August 1891.
Waxwing (*Ampelis garrulus*).
December 1892 (three).
Hawfinch (*Coccothraustes vulgaris*).
Stint (*Tringa* sp.). January 1894.
Brown Owl (*Syrnium aluco*).
Jack Snipe (*Limnocryptes gallinula*).
*Ox-eye (*Parus major*).
Stock Dove (*Columba œnas*).
Grasshopper Warbler (*Locustella nævia*).
*Marsh Tit (*Parus palustris*).
Mountain Finch (*Fringilla montifringilla*).
Cirl Bunting (*Emberiza cirlus*).
Siskin (*Chrysomitris spinus*).
Four seen.

11th Feb. 1895. Great frost. Put down food on river bank in front of my house and saw feeding during the day the following birds:—Rooks, Jackdaws, Snipe, Pheasants, Waterhens, Great Tit, Blue Cap, Marsh Tit, Chaffinch, Sparrow, Water Ouzel, Yellowhammer, Robin, Wren, Blackbirds, Thrush, Hedge Sparrow, Starlings.

The Stint was presented to the Ripon Naturalists' Society, in whose museum it can now be seen.

Naturalist,

HANCOCK PRIZE COMPETITION.

A RAMBLE IN NORTH-WEST DURHAM.

F. W. RITSON,
Jesmond, Newcastle-on-Tyne.

At 10 a.m. one bright morning in the first week in June 1898, I started from Lanchester to have a ramble among the fell-land and woodlands surrounding the district. My course lay in a westerly direction, and on proceeding up the old-fashioned village of Lanchester I took the first road to the left, and by a sharp walk soon left the village and its distant sounds far behind me. This road is called the Newbiggen Lane, and during my walk up this road I saw several of the small songsters; the Robin, Chaffinch, Greenfinch, and Yellowhammer were all to be seen or heard, as they flew about amongst the trees seeking for food for their young. After having walked about a mile up this road I turned into a field, which leads towards Humber Hill, which I intended to visit, and the side of which is thickly overgrown with Heather. The first field I entered was partially overgrown with Whins, and I had not got very far before I saw a bird rise, and fly towards a copse-wood on my left; by its chattering cry, and its long tail and pied plumage, I recognised it to be the Magpie, and that he had been up to some mischief. Having reached the middle of the field I raised several Rabbits and a Partridge; the rabbits all running towards the small fir wood, towards which I was approaching. Leaving the whin-clad field I entered the wood and saw two or three Cushats fly from the trees further ahead, and on looking into the branches I could see two or three nests. On passing a tall fir-tree I was somewhat startled by a Pheasant rising from her nest, which was placed at the foot of the tree; it contained fourteen eggs nearly incubated. At the other side of the wood I found another pheasant's nest covered over with leaves and small branches, and was in doubt whether the nest had been forsaken or not, but on feeling it, I found it to be quite warm. I was somewhat puzzled as for what cause the leaves were strewn over the nest, and I since have learned that the pheasants, when their eggs are nearly hatched, when they leave their nests throw some leaves over it, so as to render it less conspicuous. A Chaffinch's nest, containing five young birds nearly feathered, I found in a hazel bush about ten feet from the ground. On leaving the wood I disturbed a Hare from its seat; it soon made itself disappear through the hedge. I had

just started to walk in the following field, which was a hay-field, when I set up another hare, and on going a few feet further I walked right on to a leveret about six weeks old; it never stirred, but was just couching close to the ground with its ears thrown back, and its beautiful yellow-circled eyes staring as if into nothingness. I walked on, and immediately I had turned my back, I heard the grass rustle behind me, and on turning round saw the leveret skipping along with its long legs stretched as if to straining point. As I walked further afield I saw several hares and leverets, some of which fled at my approach, whilst others sat, thinking I never saw them, and trusting to the harmony of colour of their coat and the ground for protection. I also saw several Larks rise out of the grass and others fly into the grass as if feeding young; several times a lark would rise almost at my feet, and although I spent some time in searching for their nests I only succeeded in finding one, which contained five young birds. This nest was made of dried grass and a few horse hairs to line it with. Not far from this I saw a Corncrake leave a clump of grass and run along, dodging her way between the entangling mass. Marking the spot, I went straight forward, and here was the nest with its full complement of eggs; they seemed quite fresh, and as the bird had just left them were quite warm. This is only the third corncrake's nest I have ever found in my life, and I think it is almost impossible to find them, so securely hidden are they, unless one sees the bird leave the nest, or one stumbles upon a nest unavoidably. In a field to our right I heard the plaintive musical note of the Curlew, and after a little while I saw one of the birds in the air, flying as at some alarm, all the while intermingling its flight with its wild cries.

The field I next entered presented a beautiful sight, the hedgerows were a mass of bloom, Cowslips nearly covered the field, whilst here and there upon the hedgeside could be seen the modest little Violet. Crab-apple trees were in full bloom, and in one of these trees I found the nest of a Chaffinch. Nothing, I think, could present a more beautiful sight than this nest did; lying within a fork of one of the outer branches and almost covered with bloom; the mother bird intent on the parental cares never endeavoured to leave the nest, and I did not disturb her, preferring to leave such a pretty sight for another to see, should one who cared to observe happen to set eyes on it. Along the hedge-side and over the field several Blue and White Cabbage Butterflies were seen, flitting from flower

to flower, or resting upon the grass in the sun. As I was about to see if I could discern the male Chaffinch, I found him perched upon a Hawthorn branch, pausing every minute or so in his song to snatch a passing insect. One of the Blue Butterflies happened to fly too near to him; ending his song abruptly he darted forward, caught the insect, and proceeded with his song as if nothing whatever had happened. The field I had just entered was sown with oats, which were about a foot high and seemed strong and healthy. I saw several Swallows darting along over its surface, twittering to one another as they passed. I also saw two or three of these birds flying in and out of a cattle-hemmel in the next field, so I went towards it, and on arriving found that several birds had built their nests under the roof among the leaves. I now entered the Heather-clad field of Humber Hill, and had hardly got over the railings when a Pheasant left her nest a little to my right and made off up the hill, and lighted in the heather; the nest was an ideal pheasant's nest, made of entwined bracken and dead leaves, all interlaced with dead grass. I never before had seen a nest so complete made by a pheasant. Leaving this nest I walked into the heather, which was up to my knees, and started what I took to be a Whin-chat out of the heather to my left. Thinking it hopeless to seek for a nest in such a place I walked on, and had got about 20 yards up the hillside when a Partridge flew up almost at my feet, and endeavoured to fly away. She had not got many yards until she fell into the heather again. In this place I was able to see her, because the heather is not so thickly overgrown. Going forwards I saw a little partridge chicken running across some open place immediately to my right; another soon followed, and another, and then quite a number followed and were lost amongst the heather. Not wanting to follow them I turned my attention upon the old bird, which on my approach again struggled violently to regain her wings. At last, when I was quite near to her, and having been quite convinced that she was a lame bird, she took to her wings, now strong and healthy, and with a derisive triumphant call she alighted in the heather, in the place where her chicks had betaken themselves. I was much impressed with the scene, both as regards how perfectly she imitated her inability to fly and also with the parental care and anxiety which she demonstrated to me, showing how great is the power of instinct in birds. As I proceeded along the top of the heather I came across a Grass Snake coiled up and basking peacefully in the

now nearly mid-day sun. Picking it up I put it in my box for a specimen. So pleased was I in obtaining this reptile that it became my chief anxiety to get it home safely that day. Now turning towards the side of the field I started a Fox, which, like the snake, had been basking; it slunk away, never looking behind it until it reached the hedge; then giving a sharp glance in my direction to assure itself that no one was in pursuit, it leisurely went through and made for the woods to the left. In an old knarled Ash on the hill-side I saw a Titmouse's nest in a hole in the trunk. Sitting down I watched the birds as they entered and came out from their home. Creeping up the tree trunk the mother bird would secure a few insect larvæ or grubs, then would enter, and immediately a faint squeaking noise would be emitted by the young birds all eager to be first fed. In the remains of an old dry wall, all overgrown with moss and ferns, I found a Common Wren's nest, situated in the dead leaves of a fern which was growing from the wall; constructed of fern fronds, moss, and lichen, it presented quite a safe retreat, it being almost inconspicuous from the fact that the dead growths of last year hung over and completely hid it. All the while I was looking at the nest the hen-wren kept chirring about from twig to twig of the surrounding Brackens. As I was leaving the field I found a Blackbird's nest in a whin bush, whilst quite near to it was a Thrush's nest, also in a whin bush about three feet from the ground. They both contained young; the young of the thrush forsook the nest as I was looking at them.

Leaving now Humber Hill I crossed the road, and made for the fir woods of Woodland's Estate. In order to reach this, one has to cross over four heather-clad fields, and on this occasion I only observed a Curlew rise and fly away towards the left. The first wood I entered on this occasion is plentiful in Squirrels, and even now as I approached I saw one scamper along the ground at the wood's edge, spring on to the railings skirting the wood, and from thence on to the nearest fir tree, to hide himself in the higher branches. When I came to the tree I saw him clinging to the trunk, uttering a peculiar noise as if he had cold, then all of a sudden, as if he thought I was too near to him, he bounded on up the tree, springing from branch to branch with the greatest agility; then, when he had reached a high branch, he stopped, stuck his tail upon his back, pricking up his ears and turning his head slightly to one side he watched me until I moved off. Not having gone more than a few yards I saw two more scampering along the high branches to hide

themselves on my approach. In a fir-tree I saw a squirrel's nest, and on sitting quiet for a little while saw a squirrel come out, look about, then dart away back again. I was going to climb the tree to see the nest more closely, but past recollections of taking a squirrel's nest restrained me. One cannot, I think, but be impressed by the peculiar death-like stillness of a fir-wood. Every sound is as it were so exaggerated by the stillness, that the crack of a twig by a squirrel can be heard a great distance. Only the slight sighing of the breeze through the needle-like leaves, or the weak notes of the Titmouse and Goldcrests are to be heard as they creep among the branches or flit from twig to twig in search of their food. I have been in this same fir-wood, in all seasons of the year, and I think the silence is endless, save when it is broken by the invasions of man. Silence belongs alone to the evergreen fir-woods. On this occasion I saw several Cole Tits climbing the trunks, and saw a common Tree Creeper, driving its hook-like bill into every available crevice, uttering all the while a faint squeaking-like note. The Goldcrest is an inhabitant of almost every pine-wood, and I saw them, as little specks, busy high in the upper branches. Advancing, I heard a Carrion Crow leave the wood, and on looking at each tree as I passed I found the nest at the top of one of the small firs. I scaled this, and found six young crows without the sign of a feather as yet appearing. I since learned that the first nest of the carrion crow was destroyed, and that she built again quite near the former place. At the extreme left of the wood I heard the voice of the Cuckoo, but never saw one the whole day, although I heard several. On gaining the border of the wood I observed a Magpie with five young birds which she was teaching to fly; they caused me great amusement by their futile attempts; on my approach the mother-bird chattered from branch to branch, with tail upraised and open mouth, the young birds making for the topmost branches as best they could.

Having crossed from this wood to the following one, which was about 200 yards distant, the first object I saw was a Jay, which had been too intent on devouring some dead Rabbit as not to withdraw before I got so near. He flew into the depths of the wood, his beautiful wings shining like blue stars in the light of the sun, his derisive laugh being audible for a long period after his disappearance. Other objects of interest which I observed were the Stoat, the Kestrel Hawk, and the Weasel; the former had evidently been sleeping, as he started

from almost at my feet, and ran along amongst the undergrowth with a rapidity quite astonishing. The Kestrel I saw flying over the fir tree tops; every now and then turning with his head to the wind, he would hover for a few seconds without moving his wings. This he continued for a long distance, then with a sudden swoop to the ground he was lost to sight. The Weasel I found was lying curled up in a circular fashion at the foot of a tree, and on my approach took to his heels, disappearing into a wall close by. And now I determined to start for home, this time by way of Browney Burn, which is a streamlet, a tributary of the Wear, here and there diversified with overhanging willows and sedgy banks. In order to reach the Browney I had to cross a large heathery field, in some places boggy and sedgy, in others dry and hard. Leaving the wood and turning sharply to the left, I walked along the heather in search of anything which might be of interest to me. I had not proceeded far when a bird flew out of a clump of heather on my right-hand side, dark in colour, and with a wavering flight. I took the bird to be a Nightjar, and on going to the place from whence it flew I was convinced that it was that bird. After a little search I found the full complement of eggs, lying on what was supposed to be the nest, but which was in reality simply a flattening down of the heather and grass. So closely do these birds harmonise with their surroundings, that on another occasion when I came across two young birds on Humber Hill quite accidentally I could hardly believe my eyes; they were, in fact, the exact colour of the heather upon which they were lying. This same day when I was climbing the fence to get to the burn I found a Nightjar resting on the railing which skirted the wood. Lying full length upon it, it thus so materially lessened its chances of discovery as almost to be invisible, and I would never have thought it anything else but a piece of wood had it not moved slightly as I was getting over the railings. At the lower end of this field, near a marshy stretch of land, I flushed a Snipe, which, after its usual darting flight, rose above my head, making a peculiar noise with its wings as it flew. I searched for the nest, but was unsuccessful. Several Peewits were also flushed, and I found two or three young birds, one of which presented one of the most peculiar and humorous sights I have ever seen. At first I could see nothing but a piece of shell moving; then on going nearer I saw a little head and fluffy neck. Picking it up I found the young Peewit had been wandering about with half its shell on. I released it,

and on setting it free it ran among the surrounding heather, every now and then stopping as if in grateful acknowledgment of my act. This, I think, was the most peculiar thing I had seen that day, and I shall long remember it. And now I had reached Browney Burn, and one of the first things I saw was a large Water Vole on the bank-side, which, on my approach, dived from sight into the stream below. A little down stream I saw an old willow and was attracted to it on account of the numerous fungi protruding from it. Whilst, however, I was looking at it, I saw a little bird leave the tree, and in a second or two return and go into a hole about six feet from the ground. This bird, I thought, was the Marsh Tit. Whilst I was standing it passed in and out about ten times, never once ceasing from its labours except to smooth a damaged feather or to take some food itself.

Passing through a small copse I disturbed some little Wood-Mice, which seemed to be creeping all about the place, now and again making their little squeaks of danger. I saw several large Trout in the Burn, and on a small branch overhanging I observed a Kingfisher, and after waiting for a considerable time I was rewarded by seeing it carry on its fishing operations. I also saw a family of Grey and Common Wagtails, sporting amongst the stones at the brook side, and a little distance from this I found a Mallard-Duck's nest, which was built of grass and twigs, and lined with down taken from her own body; it contained fourteen eggs nearly incubated. And now I was fast drawing near home again, the pine-woods far behind me were looming out dark against the sky, the sun already was sinking in the west, the only sounds to be heard were the cries of the Curlews on the distant fell, the music of the Cuckoo in the Beech-wood to my right, and the twittering of the Swallows as they prepared to rest. The Sedge-Warbler had not yet given up song, and his merry notes were poured forth from a neighbouring hedge; the Crows flying home to roost in the distant Greencroft Woods, all these showing that evening was fast approaching, and that my day's rambling in fell land, field, and wood was fast drawing to a close. And so I returned, having enjoyed this day with nature and nature's objects. My closing thought was that of Wordsworth when he wrote:

> One impulse from a vernal wood,
> May teach you more of man;
> Of moral evil and of good,
> Than all the sages can.

1900 May 1.

NOTE—ORNITHOLOGY.

Little Auks near the Spurn.—We have had a great many Little Auks (*Mergulus alle* Linn.) about here since the last week in February to 20th March; very many have died.—P. W. Loten, Easington, 29th March 1900.

NOTE—HYMENOPTERA.

***Sirex gigas* at Ashby, Linc. N.**—I got about 40 *Sirex gigas* from a spruce trunk last July, many in the larval or pupal state.—R. T. Cassal, Ashby, Doncaster, 11th February 1900.

NOTE—LEPIDOPTERA.

***Eupithecia pygmæata* at Ashby, Linc. N.**—At present the best insect I can report is *Eupithecia pygmæata*, on 4th June 1899, flying in the sunshine at Ashby. I did not know the insect at the time, or could have taken several. Mr. Porritt identified it.—R. T. Cassal, Ashby, Doncaster, 11th February 1900.

NOTE—MAMMALIA.

Badgers at Tathwell, near Louth, etc.—Mr. Edward Preston Rawnsley, Master of our Southwold Foxhounds, told me the following, when meeting last week, for the last time this season, on my moor:—

On Monday, 25th September 1899, the Southwold Hounds met at Tathwell, near Louth. A Badger (*Meles meles*) was on foot in Lawrence Wood. The hounds got on the scent and ran it hard. The Badger, a fine dog specimen, could get little or no shelter when once in the open, as the Tathwell fields are the largest in the county, some of 300 acres to one field, and hedges therefore are few and far apart. However, he gave them a good run of more than an hour. These hounds are very swift, but he was well up to the pace, and took the ground in a drain tunnel, whence he emerged occasionally to fight the hounds. They were the bitch pack, and he fought so stubbornly that they could not face him. To cut matters short, the Hon. H. Heneage at last despatched him with a blow on the head from a stout stick. He weighed 29 lbs. This is a very good weight. I see that a Badger, accidentally killed in Ware Park, Herts., last month (March 1900), and said to be in splendid condition, weighed 18 lbs.

Badgers are said to be very useful in a fox-hunting country, as they often live in the same den as the Fox, and keep it clean, to his advantage, as the Fox is not a cleanly animal.

On the 5th of this month (April) a dog Badger and two cubs were taken at Preston, near Uppingham; they were in the den of a Fox, which, with the female Badger, managed to escape. This male weighed 24 lbs.

I was glad to learn from the Master that Badgers are on the increase in many of our coverts.—J. Conway Walter, Langton Rectory, Horncastle, 13th April 1900.

BOOK NOTICE.

We have to thank Mr. **R. Taylor Manson**, F.G.S., of Darlington, for a little pamphlet entitled '**Outlines of the Geology of South Durham**' which has been reprinted from the Darlington Half Holiday Guide—which (the reprint) is on sale at the modest price of 3d. (W. Dresser & Sons, publishers, Darlington). The little pamphlet gives a general account of the various formations, which is illustrated by various blocks of geological sections. It will be most useful to all who wish to learn something of the Darlington neighbourhood.

LINCOLNSHIRE NATURALISTS AT FRIESTON.

Rev. EDWARD ADRIAN WOODRUFFE-PEACOCK, L.Th., F.L.S., F.G.S.,
Vicar of Cadney; Organising and Botanical Secretary, Lincolnshire Naturalists' Union.

On Bank Holiday, August 7th, 1899, Boston Station was the rendezvous of a number of members of the Lincolnshire Naturalists' Union, including Mr. F. M. Burton, Vice-President (Gainsborough); Rev. Sumner C. Wood (Ponton); Mr. and Miss Stow (Brandon); Mr. B. Crow, Miss Crow, Mr. R. Muir, Mr. T. Gelsthorp, Mr. and Mrs. J. Larder (Louth); Mr. J. S. Sneath, Mr. and Mrs. G. A. Grierson (Lincoln); Mr. H. Preston (Grantham); Mr. W. H. Kirkby (Swansea); and the Honorary Secretaries, Rev. E. A. Woodruffe-Peacock (Cadney) and Mr. R. W. Goulding (Louth). At Frieston Shore the party received an accession of numbers, Mr. J. C. and Miss Lane-Claypon, of Tytton Hall; the Rev. Canon and the Misses Staffurth, and the Rev. H. A. Barker, of Wrangle, joining it. This was the 23rd field meeting of the Union.

The object of the meeting was a visit to Frieston Shore, whither the party proceeded by drag. Three of those present were entomological workers, the others interesting themselves in the botany of the locality. The first halt was made at Skirbeck, where, after a short examination of the principal features of the church, the party paid attention to the Witham Bank, keeping a diligent but unsuccessful look-out for *Atriplex pedunculata, Statice reticulata,* and *Lysimachia thysiflora*, which have been lost for years, though there are existing localised specimens for Boston or Frieston.

The whole of the ground worked was the richest fenland alluvium, carrying magnificent crops, amongst which the Woad (*Isatis tinctoria*), a plant now rarely cultivated in England, but grown from the most ancient times about Boston, was carefully observed; along with Mangel-wurzel, Turnips, and Swedes flowering for seed-production.

Though not particularly interesting to field geologists the fenland deposits are to botanists, for there, better than elsewhere, are preserved the records of our past flora and the fauna it supported. During the Great Ice Age, when the Boulder Clay and greater part of our surface rocks were brought into their present state, subsequent denudation being allowed for, at a period variously estimated at from 15,000 to 100,000 years ago, the whole of the before-existing British vegetation was

swept away from Lincolnshire. The peats of the low-lying swamps since that time, for we have none older, have been the best preservers of the records of our ancient forests and flora, as the coal formed under similar circumstance was at an earlier age. The Great Fenland in Lincolnshire, Cambridge, and Norfolk supplies us with the fullest and most valuable evidence as to the antiquity of our forest trees. Two beds of peat are found in this great level. One lies on the Boulder Clay floor of the Fenland, buried by sand and silt brought down from the watersheds of the fen rivers, at a depth varying from 8 feet to 18 feet. The other is found above the silt wherever stagnant water has collected on its surface. The upper and modern bed contains late flint implements and signs of Roman occupation, and may date back from 2,500 to 100 years, as the case may be, but can hardly be earlier from the rate at which the silt has been deposited, and the position in which the beds are found in respect to it. The lower peat must have ceased growing at the time the brackish water of the Wash began to deposit the silt, so we can easily assign an approximate date to the period at which the lower peat bed ceased to be formed. Some idea of the rate at which the silt deposits have taken place above it may be gathered from what is now going on, and from the area of the land which has been recovered from the sea during the last sixteen centuries, for there is no reason to suppose the rate has ever fluctuated much either way. The greatest accretion of land from silting up has taken place at the head of the old Roman bay at Briker Haven in South Lincolnshire. Here successive enclosures have taken place from time to time, until the bank made by the Romans at Holbeach, for the protection of their corn land from the sea, is left from three to four miles inland. Now granting, which cannot be disputed, that these banks were made from 1,500 to 1,600 years ago, it will be found that the rate of growth has been about 9 feet to 10 feet a year. Allowing the same rate of accretion in past ages as we find at present, it would take 13,000 to 15,000 years for the formation of the alluvial deposits of the present Fenland above the lower peat stratum, which must have stopped growing before or at the time the silt began to be formed.

When trees are only found in the upper peat bed they may be called modern, for they can only have been with us from 100 to 2,500 years, and may have come with the Romans. But when they are found in both beds, above and below the alluvial deposits, they have been growing and seeding in Lincolnshire from 13,000 to 15,000 years. The species referred to here are those growing in our woods and hedges to-day.

From the two beds we get the following species:—Oak, Scotch Fir, Yew, Birch, Alder, Beech, and Hazel Nut. From the upper bed only:—Elm (*Ulmus montana*), Ash, Holly, Willows (species undetermined), Reed, et hoc genus omne of fen plants.

We have another means of testing the age of our forest trees also. The Danes invaded England from 450 to 850 say. In Lincolnshire alone they have left places called after most of the above-named trees, and also the Apple (*Pyrus malus*), White Thorn (*Cratægus oxyacanthoides* Thuill.), not the species of our hedgerows (*C. monogyna* Jacq.), which is a German variety, but the true old English White Thorn, and, lastly, the Elder (*Sambucus nigra*), I believe, but perhaps the Danewort (*S. Ebulus* L.), which, I am delighted to say, is growing with us still. In the Oak forests of the old peat Squirrels lived and piled their store of Hazel nuts for winter food, the Bees collected honey from fragrant flowers, and the dug or burnt-out oaken boats, of the ancient Britons or their predecessors, were caulked with mosses which are now growing with us, as they hunted the wild fowl or caught the fish which still frequent the marsh waters. Over the whole of the 'Black Land' which fringes the alluvium, and which indicates the spot where the lower peat bed comes to the surface, hundreds of Oak trees lie buried in the peat along with their ancient flora. After being dug out they are found rotting into slow decay by the borders of arable fields, set up as gate-posts, stack-props, etc., or are used as fuel.

Shortly before four o'clock the members visited the exceedingly fine and interesting Priory Church of Frieston, after which they adjourned to the house of the Rev. Canon Staffurth, who most kindly entertained them at tea, which agreeably relieved the fatigues of the day. After tea Mr. Burton, in the name of all present, cordially thanked Canon and Mrs. Staffurth for their courteous hospitality.

Before proceeding to the business ordinarily transacted at meetings of the Union, Mr. Burton voiced the general feeling when he moved a sympathetic vote of condolence with Mrs. Cordeaux and her family in their recent bereavement. During the day Mr. Cordeaux's genial presence, stimulative enthusiasm and kindly words had been greatly missed, for it was fresh in the memories of members that when the Union met at Saltfleet, only two months ago, Mr. Cordeaux's observations on the bird-life of the district added greatly to the interest of that meeting. Mr. Burton said that he wished to utter a few words expressive of real regret and of deep sorrow at the great loss the Union had sustained by the death of their good friend Mr. Cordeaux.

He was one of the founders of the Union, he was its first President, and he had been untiring in his endeavours to promote the objects for which it was formed. He had also been President of the Yorkshire Naturalists' Union; he was one of the best ornithologists in England, and had added largely to our knowledge of the birds of the Humber district. He was a good speaker, and also a good writer. If any proof of the latter statement were needed, they had only to look at the last number of 'The Naturalist' where they would find an article from his pen on the death of his friend, Mr. Bendelack Hewetson. The description which Mr. Cordeaux there gave of his last walk with Mr. Hewetson might have been penned by Audubon. He could only hope that when some record of his life work was given in 'The Naturalist,' it would be a record worthy of his whole-hearted goodness and of his all-round knowledge.

The usual alluvium plants were observed and noted for the flora. The best were as follows:—*Caucalis nodosa*, *Œnanthe Lachenalii*, *Senecio aquaticus* (very fine), *Juncus Gerardi*, *Polygonum terrestre*, *Lepturus filiformis* (much over a foot long), *Hordeum marinum*, and *Spartina stricta*. *Althæa officinalis* and *Marianum lactea* were very conspicuous.

The Mosses taken by Miss S. C. Stow were as follows:—

Tortula muralis Hedw.
Barbula fallax Hedw.
Bryum argenteum L.
Bryum capillare L.
Bryum cæspiticium L.
Mnium undulatum L.
Pleuropus sericeus Dixon.
Camptothecium lutescens B.&S.
Brachythecium rutabulum B.&S.
Eurhynchium prælongum B.&S.
Hypnum cupressiforme L.

Mr. H. Preston, F.G.S., occupied his abundant leisure by sweeping the following Spiders and Insects, which have been duly reported on by the Revs. O. Pickard-Cambridge and A. Thornley:—

Epeira quadrata C.L.K.
Epeira umbratica C.L.K.
Meta segmentata Clk.
Zilla x-notata Clk.
Pachygnatha degeerii Sund.
Philodromus fallax Sund.
And the Phalangid
Oligolophus tridens C.L.K.

COLEOPTERA.

Staphylinus stercorarius. One example.
Sitones lineatus.
Demetrias atricapillus.

HEMIPTERA.

Miris lævigatus. Several.
Miris calcaratus.
Nabis limbatus.
Heteratoma merioptera. Several.
Cixius nervosus.
Philænus spumarius.

DIPTERA.

Melanostoma mellinum.

TENTHREDINIDÆ.

Priophorus padi.

WEATHER AND BIRDS.

Rev. EDWARD ADRIAN WOODRUFFE-PEACOCK, L.Th., F.L.S., F.G.S.,
Vicar of Cadney; Organising and Botanical Secretary, Lincolnshire Naturalists' Union.

The late John Cordeaux in 'The Naturalist,' 1900, p. 32, commenting on Mr. Brogden's S. Lincs. Bird List, says:—'Some birds, several of them being quite common species, appear to have unaccountably decreased near Spalding, such as the Mistletoe Thrush, the Redbreast, Hedge Sparrow, and Jackdaw.' The late Mr. Brogden's List was written during the summer of 1896, and never added to subsequently. The word 'unaccountably' is scarcely the one I should have selected under the circumstances. The species named, and many other of our commonest birds, decreased here considerably after the fifty-nine days' frost of 1891, and were more than half killed off by the terrific frost of the early months of 1895. One morning during that latter storm at both South Kelsey and Howsham the thermometer fell twenty degrees in as many minutes between 8 and 8.30 a.m. In this parish alone hundreds of birds were lying dead by the hedge sides and in the covers, the Redwing suffering terribly. In the summers of 1895, 1896, and 1897 there were fewer of our common birds to be found nesting in covert, hedge, or tree than I ever remember in my experience. The large sycamore by my garden gate here at Cadney, which had harboured a Mistletoe Thrush nest from 1890 to 1894, tradition says it always does, was without one till 1899. The Jackdaws did not come back to the church till 1898; on the 25th of January this year fifteen noisy pairs were flying round the tower. A pair of Rooks built for the first time that year in the churchyard trees, and in 1899 there were five nests. Three other strong rookeries have been established of late years round this neighbourhood at Poolthorn, Howsham, and North Kelsey. The Rook suffers less than most of our birds from prolonged frost and snow, and these rookeries have simply been formed because of the cutting down of a large wood at Somerby, four miles off, where they formerly built.

It is worth noting that the older Rooks come and take possession of their old nesting-places the first mild day towards the end of January, and sitting side by side in pairs have a quiet talk about building prospects, as it were. They begin constructing their nests, if it is mild, when March puts in; while the Winter Aconite (*Eranthis hyemalis* Salisb.) is in flower it is useless

to begin. The birds of last season, or what I have always taken to be them, do not follow their elders' example till well into April. The fifth nest here in 1899 was not begun till the 26th April, and Sunday, the 30th, was the day they worked at it and practically constructed it. It is not a difficult matter to form a rookery, if one is wanted, where there are suitable trees; but as the Rook has learned such bad habits and grown so remarkably destructive, during the late hard winters and dry summers, it is not so popular as it once was.

Frost and snow, as far as my experience goes, will drive most of our common birds to the swede fields at last. The hips and haws (i.e., *Rosa* and *Cratægus* fruit) do not last for long, and with the failure of insect life, earth-worms, etc., if the cold is prolonged their doom is certain. Nature is cruel with her prodigal abundance of life, and 'the crumbs thrown out to the birds' by well-intentioned people barely prolong the agony which meat or fat would at once satisfy.

Where the Hare and Rabbit are not present to set the example of eating the swedes the Long-tailed Field Vole (*Arvicola glareolus* Schreber) always will, 'charming' what he does not eat into little fragments. When pressed the Short-tailed Field Vole (*A. agrestis* Linn.) will do the same, and where the Water Vole (*A. amphibius* Desmar.) is present it is not a whit behind. The Wood Mouse (*Mus sylvaticus* Linn.) may also at times be detected as busy as the rest. I have never found the Common Shrew (*Sorex vulgaris* Linn.) eating swede, but it is a purely animal, insect, or molluscan feeder, I believe.

But our common birds require no suggestions from the animal world, their own observation has taught them that, even in mild, open weather, within 'the warbles' of the swede lies a very dainty piece of insect food, in the grub of the Turnip Gall Beetle (*Ceuthorrhynchus pleurostigma* Marsh., or *C. sulcicollis* Gyll.), according to our good friend the Rev. A. Thornley. The Rook, Partridge, Pheasant, and Thrush, even in the mildest weather, will all attack the roots for the grubs, opening the way for the weaker-billed birds to follow should necessity constrain them. During this January I examined many thousands of swedes, both growing in the fields or 'led off' into pastures and meadows for ewes to feed on. The greater majority were 'warbled'; some very badly indeed. In the growing crops few of the galls had been opened, and then apparently only during the spell of rough frost and snow that set in on the 10th December 1899. But where they had been 'led off' in nearly

every instance the 'warbles' had been opened and the grub extracted. In the case of the larger roots, which were not easily turned over, the warbles on the lower side were still entire. Here and there a natural swelling on the Swede had been mistaken for a gall, and the huge slashing cut left by the Rook's (?) bill was remarkable; only in one case did I find that an attempt had been made twice. The blow is struck from one side just to cut off the top of the 'warble' and expose the grub. Some of the holes by which the grubs had been taken out were so clean and gimlet-like that I cannot help thinking they were the work of Thrushes. The grubs themselves varied in colour from cream-white to deep orange in the same field. Can there be two species? Those that bore into the root above and below ground. I could find no difference between the 'warbles' of the roots grown on clay-carr, i.e., peat mixed with a little Oxford Clay, and gravel-carr, i.e., chalk drift gravel and peat. Only in one case did I find that a bird had been feeding on the Swede itself. The hole was long, narrow, and deep, and was on the middle of a fairly flat surface where a ewe had been feeding; I do not doubt the bird was a Pheasant.

This reminds me of a passage in an article by the late John Cordeaux on 'Some Foot Prints in the Snow' ('The Naturalist,' 1887, p. 72-74). I think it is worth while to make a short extract. Remarking on the mischief the Fieldfares were doing to a 'plot of swedes,' he continues, 'I shot one old bird with his head buried in the root, and his beak filled with yellow pulp; upwards of one hundred roots were more or less excavated. In some instances little more than the outer rind was left. Neither had Hares or Rabbits first attacked the roots, and thus given countenance to the hungry birds. Some roots were quite freshly attacked, with a hole pierced through the smooth rind such as a gimlet would have made.' Perhaps my observations were made in too open a time. In any case this note is interesting, and would be more so if in the paper we had any indication of the duration of the storm of January 1887.

NOTE—MAMMALIA.

Whiskered Bat near Barnsley.—I took a specimen of this species (*Vespertilio mystacinus*) from Rockley Abbey, near Stainborough Woods, on the 14th of April. I may also state that I took another specimen of Natterer's Bat (*V. nattereri*) from the tunnel in Broom Royd Wood on 24th March. It escaped a few days later.—JOSEPH ARMITAGE, 129, Park Road, Barnsley, 23rd April 1900.

BOOK NOTICES.

Our friend Mr. **S. Lister Petty** has an interesting series of articles running in the 'North Lonsdale Magazine,' the subject being **'The Guide-Book Writers'** of the Lake District. The first article is on William Green, 1760—1823, and appeared in the December number of the magazine; followed in the February issue by a second on Jonathan Otley. These Lake Guide-books and their writers are of interest to us, inasmuch as the local fauna and flora finds record to a greater or less extent with them all, and Otley was particularly scientific and accurate in his methods, and, as Mr. Petty writes, his botany is thoroughly to be trusted and his localities are always properly stated.

We have received a parcel of bilingual reprints—Magyar and German—dealing with ornithological topics. A reprint from 'Aquila' for 1899 deals with bird-protection, under the title 'A madarak védelme,' by Chernel István-tól, and includes a number of illustrations of nesting-boxes and adapted trees, and of various forms of traps. To this reprint is annexed an account of the bird called 'Edelreiher' by the Germans. Another reprint from the same journal by the same writer is in discussion of a paper by Dr. Julius von Madarász. Another reprint is of a paper by Stephan Medreczky on colour-varieties of song-birds at large and in captivity (Az éneklö madarak színváltozasa a szabad természetben és a fogságban, irta Medreczky István). The last of these reprints we have to notice is an account of an Ornithological Congress held at Sarajevo in September last year (Az Ornithologusok Gyülése Sarajevóban 1899 évi Szeptember 25-29-én).

From Messrs. Percy Lund, Humphries & Co. Ltd. we have received **'The Illustrated Annual of Microscopy,'** a quarto volume in boards of 148 pages, with a coloured frontispiece representing 'Pond Life' at Leyton-stone. The articles are numerous and freely illustrated. Those which concern our sphere include one on 'A Hyaline Daphnia,' by D. J. Scourfield, with a good coloured plate. An article by Wilfred Mark Webb on 'Some Mollusca and the Microscope' bears testimony to the excellence of the work done by Mr. William Moss, of Ashton-under-Lyne. Then follows an article by Mr. Chas. D. Soar on 'British Fresh-water Mites—*Arrenurus*'—with a plate of outlines and a list of 21 British species of that genus, for a knowledge of many species of which we are deeply indebted to Mr. C. F. George, of Kirton-in-Lindsey. The remainder of the papers fall outside our purview, being mostly concerned with the technique of microscopy, relieved by one on the light side of the science, which includes a photograph of 'Ye Mikroskopiker's Arms,' to which *Daphnia pulex* and *Sida crystallina* act as heraldic supporters.

We have before us, by the courtesy of the secretary, Prof. W. W. Watts, the **Tenth Report** of the Committee of the British Association **on Photographs of Geological Interest,** as presented to the Association at Dover last year. Our Northern counties again figure largely, the present report including four from Durham, three from Lancashire, fourteen from Northumberland, and no less than fifty from Yorkshire. The photographers of these are Mr. F. C. Garrett, of Newcastle-on-Tyne, Mr. S. W. Cuttriss, of Leeds, Mr. Godfrey Bingley, of Leeds, Mr. E. J. Garwood, of London, and Mr. F. N. Eaton, of Liverpool, who have all done good yeoman service in this most important application of photography to useful purpose. We note, however, a serious omission on the part of the Secretary, no doubt by inadvertence, in that he fails to mention the indebtedness of his Committee to the Geological Photographs Committee of the Yorkshire Naturalists' Union, which was in all essential respects the pioneer in this line of research, and under whose auspices the greater portion of the 413 photographs tabulated as having been furnished for Yorkshire have been taken. All the same, Mr. Watts is to be heartily congratulated on the great success of his Committee's labours.

DIPTERA OF THE WARRINGTON DISTRICT.

FIRST LIST

(Consisting of Species named by the late Mr. R. H. Meade, F.R.C.S., Mem. Soc. Entom. France).

E. E. LOWE,

Assistant-Curator, Warrington Museum.

THE following 95 species of Diptera are part of those which have fallen to my net during four years of intermittent collecting in the Warrington district (as defined below). This list is of necessity very meagre and imperfect, and the chief reason for its publication lies in the fact that examples of all the species included in it were named by the late Dr. Meade, of Bradford, who was, until his lamented death on the 23rd December 1899, our veteran dipterologist. With all students of British Diptera I greatly regret his demise and shall sadly miss his generous help.

The Warrington district may be defined as consisting of those portions of Lancashire and Cheshire which fall within a radius of 15 miles from the town. This radius is taken in order to include that locally famous collecting ground, Delamere Forest. The district generally is flat, with few interesting geological features, the only hills I am acquainted with being those of Overton in the direction of Chester. That part of Cheshire falling within the prescribed radius is chiefly rich farming and grazing land, but I have worked very little of it save the afore-mentioned Delamere Forest. Though much reduced of late years, this latter still contains many fine oak, chestnut, and fir woods, with here and there a mere, the rank vegetation of whose borders affords cover to multitudinous insects. On the Lancashire side of the Mersey the country is flat and dreary, with several manufacturing towns. The most interesting features, from an entomologist's point of view, are the quaking peat mosses extending from Warrington to Manchester. These are, in parts, covered with plantations of small birches and firs, with here and there, in the drained portions, a wood of fair-sized trees of the same kinds. Rixton Firs is the name given to one of these woods lying about 4½ miles east of Warrington, and this has been my main collecting ground in Lancashire. It will be easily seen that much of the district remains to be worked, and I hope that this may be an inducement to others to help in making up such a list of local

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Diptera as shall be of service in the elucidation of the life-history and distribution of this order of insects. I have adopted Mr. P. H. Grimshaw's style (Nat., 1898, p. 89, etc.) as far as possible: those species which I first collected in the district, and of which I have no exact data, are placed separately at the end. Dr. Meade's authority is perhaps all that makes their names worth publishing.

MYCETOPHILIDÆ.

Sciara thomæ L. **Chesh.:** Bird Wood, Preston Brook, July 1897, common.

BIBIONIDÆ.

Dilophus febrilis L. **Chesh.:** Appleton Dingle, one swept from grass in May 1896.

Bibio reticulatus Lw. **Chesh.:** Lymm, common on laurels, April 1896.

PTYCHOPTERIDÆ.

Ptychoptera contaminata L. **Chesh.:** Moore, two swept from grass in August 1896 and two in July 1898.

Ptychoptera albimana F. **Lanc. S.:** Rixton Moss, June 1897, one from drain side. **Chesh.:** Moore, two swept from grass in April 1897.

TIPULIDÆ.

Pachyrrhina scurra Mgn. **Lanc. S.:** Rixton Moss, June 1896, one.

STRATIOMYIDÆ.

Sargus cuprarius L. **Chesh.:** Daresbury, June 1896 (var. *S. nubeculosus* Ztt.).

TABANIDÆ.

Hæmatopota pluvialis L. Common in July and August. **Lanc. S.:** Rixton Moss. **Chesh.:** Whitley, Hatchmere.

Therioplectes tropicus Mgn. **Chesh.:** Hatchmere, 18th July 1898, one ♂.

Tabanus maculicornis Ztt. **Chesh.:** Hatchmere, 24th July 1898, one ♂.

Chrysops cæcutiens L. **Chesh.:** Whitley, 31st July 1898, common.

LEPTIDÆ.

Leptis scolopacea L. **Lanc. S.:** Rixton Moss, May 1896. **Chesh.:** Moore, May 1896; Hatchmere, 11th June 1899, two ♂s.

This species and *L. tringaria* are commonly known as 'Downlookers' in the country round here, from their trick of alighting on tree trunks almost invariably head downwards.

Leptis strigosa Mgn. **Lanc. S.:** Sankey, April 1896, one. This species is in italics (signifying want of confirmation) in Verrall's list.

Leptis tringaria L. **Lanc. S.:** Rixton Firs, 27th July 1898, two.

Leptis lineola F. **Lanc. S.:** Taylor Park, St. Helens, 13th July 1898, four.

Chrysopilus auratus F. **Lanc. S.:** Rixton Firs, July 1898, common.

THEREVIDÆ.

Thereva nobilitata F. **Lanc. S.:** Rixton Firs, May 1896, one. **Chesh.:** King's Wood, Delamere, 30th June 1899, ♂ and ♀ in cop.

EMPIDÆ.

Rhamphomyia sulcata Fln. **Chesh.:** Moore, one at sallow-bloom in April 1897.

Empis tessellata F. **Chesh.:** Wood near Hatchmere, in abundance, 11th June 1899.

Empis trigramma Mgn. **Lanc. S.:** Burtonwood, in June, abundant.

SYRPHIDÆ.

Chrysogaster metallina F. **Chesh.:** Wood at Daresbury, June 1896, one.

Chilosia pulchripes Lw. **Chesh.:** Near Walton Arches, middle of May 1896, one.

Chilosia grossa Fln. **Chesh.:** Moore, April. Every year I take two or three specimens of this 'fine and rare species' (Dr. Meade) on one particular bank at Moore, when the sallows are in bloom—sometimes on the catkins, sometimes on the herbage.

Leucozona lucorum L. **Chesh.:** Whitley, 31st July 1898, four.

Melanostoma scalare F. **Chesh.:** Walton Arches, August 1897, one.

Pyrophæna ocymi F. **Chesh.:** Field near Appleton Reservoir, July 1896, one.

Platychirus manicatus Mgn. **Lanc. S.:** Burtonwood, in June and July, common.

Syrphus balteatus Deg. **Lanc. S.:** Burtonwood and Rixton Firs in July; also plentiful at Rixton Firs in September 1899. **Chesh.:** Walton, Moore.

Syrphus bifasciatus F. **Chesh.:** Appleton Dingle, May 1896, one.

Syrphus arcuatus Fln. **Chesh.:** Moore, June 1896, one.

Syrphus corollæ F. **Chesh.:** Walton Arches, August 1897, abundant on Compositæ.

Syrphus tricinctus Fln. **Lanc. S.:** According to Dr. Meade this handsome species is rare—he having none in his own collection. It occurs in Rixton Firs during May, and I have taken, I think, five specimens altogether. The dark colour of its body makes it difficult to distinguish among the fir-needles. Its bright yellow bars usually betray it, however.

Catabomba pyrastri L. **Chesh.:** Moore, June 1896, one; Hatchmere district, July 1897, several.

Rhingia rostrata L. **Lanc. S.:** Sankey, Burtonwood. **Chesh.:** Frodsham. Common in July and August.

Volucella bombylans L. **Lanc. S.:** Sankey, July 1899, three.

Volucella pellucens L. **Chesh.:** King's Wood, Delamere, July 1897, two; Frodsham, July 1898, one.

Eristalis intricarius L. **Lanc. S.:** This species (both sexes) was literally swarming round a large hawthorn tree, which was in full bloom, in a clearing in Rixton Firs in the middle of May 1897. **Chesh.:** I have taken it also at Moore in the same month.

Myiatropa florea L. **Chesh.:** Preston Brook, July 1897, one.

Helophilus pendulus L. **Chesh.:** Malley Common, near Walton Arches, July 1896, common; Flaxmere, June 1899, one.

Xylota segnis L. **Chesh.:** Preston Brook, July 1897, one; Hatchmere, 11th June 1899, one.

Xylota sylvarum L. **Chesh.:** Preston Brook, July 1897, one; Whitley, 31st July 1898, one.

Syritta pipiens L. **Lanc. S.:** Rixton, Sankey, St. Helens, Knowsley. **Chesh.:** Moore, Preston Brook, Walton, Appleton, Delamere. Abundant in June and July.

Chrysotoxum arcuatum L. **Chesh.:** This is the only *Chrysotoxum* I have seen in this neighbourhood. It has only occurred to me once, i.e., in numbers flying along the roadside near Hatchmere, 11th June 1899.

DEXIDÆ.

Thelaira leucozona Pz. **Lanc. S.:** Rixton Firs, 27th July 1898, three.

Dexia canina F. **Chesh.:** Abundant on the bracken in King's Wood, Delamere, 18th July 1898. This is the only occasion on which I have seen it.

SARCOPHAGIDÆ.

Sarcophaga carnaria L. **Lanc. S.:** Woolston Moss, July 1897, common.

MUSCIDÆ.

Lucilia cornicina F. **Lanc. S.:** Rixton Firs, June 1897, one.

Lucilia cæsar L. **Both Counties:** Abundant all the season wherever I have collected.

Lucilia sylvarum Mgn. **Chesh.:** Borders of wood near Walton Arches, July 1896, one.

Calliphora grœnlandica Ztt. **Lanc. S.:** Common in Warrington, July 1897.

Musca domestica L. **Both Counties:** Common in houses, occasionally becoming an intolerable nuisance.

Musca corvina F. **Chesh:** Whitley, 31st July 1898, common.

Mesembrina meridiana L. **Chesh.:** Frodsham, June 1896. King's Wood, Delamere, 18th July 1898, along the sides of a small brook; almost every tree had five or six specimens of this large and handsome fly resting on its trunk.

Graphomyia maculata Scop. **Chesh.:** Hatchmere, 3rd Sept. 1899, one.

Morellia hortorum Fln. **Lanc. S.:** Rixton Firs, 27th July 1898, several of both sexes. This fly very closely resembles *Polietes albolineata* Fln., which occurs with it on the leaves of birch and other trees. It is at once separated, on examination, by the angular termination of the fourth longitudinal vein.

Stomoxys calcitrans L. **Lanc. S.:** Abundant on the doors and outside walls of houses in Warrington in October 1899.

ANTHOMYIDÆ.

Polietes lardaria F. **Lanc. S.:** Rixton Firs, on 5th September 1899, was simply alive with multitudes of this species. **Chesh.:** A wood at Hatchmere, on 3rd September 1899, abundant. I saw odd specimens at both localities on earlier dates.

Polietes albolineata Fln. **Lanc. S.:** See remarks on *Morellia hortorum* Fln.

Mydæa urbana Mgn. **Chesh.:** Hatchmere, 11th June 1899, three.

Mydæa pagana F. **Lanc. S.:** Rixton Firs, July 1897, two.

Hylemyia flavipennis Fln. **Lanc. S.:** Knowsley Park, July 1896. **Chesh.:** Arley, September 1898, several.

Hylemyia strigosa Fab. **Chesh.:** Helsby, 7th June 1899, one.

CORDYLURIDÆ.

Scatophaga stercoraria L. Abundant all the summer wherever I have collected. I took a pair in cop. at Sankey (**Lanc. S.**), 18th August 1898.

TRYPETIDÆ.

Acidia heraclei L. **Chesh.:** Walton Arches, May 1896, two.

BORBORIDÆ.

Borborus equinus Fln. **Lanc. S.:** Abundant on ditch-sides near Rixton Firs, August 1897.

The following species have occurred in the district and have all been named by Dr. Meade. I have no notes, however, of localities or dates of capture, so that neither can be given with sufficient precision :—

BIBIONIDÆ.

Bibio marci L.

Bibio leucopterus Mgn.

Bibio nigriventris Hal.

TIPULIDÆ.

Pachyrrhina quadrifaria Mgn.

Pachyrrhina imperialis Mgn.

DOLICHOPODIDÆ.

Dolichopus æneus Deg.

SYRPHIDÆ.

Chrysogaster cæmeteriorum L.

Platychirus peltatus Mgn.

Syrphus umbellatorum F.

Syrphus cinctus Fln.

Syrphus ribesii L.

Eristalis tenax L.
Eristalis arbustorum L.
Eristalis pertinax Scop.

TACHINIDÆ.

Gymnochæta viridis Fln.

MUSCIDÆ.

Lucilia sericata Mgn.
Pollenia rudis F.
Cyrtoneura stabulans Fln.

ANTHOMYIDÆ.

Hyetodesia lucorum Fln.
Hyetodesia scutellaris Fln.
Hyetodesia flaveola Fln.
Mydæa impuncta Fln.
Spilogaster quadrum Fln.
Hylemyia seticrura Rnd.
Hylemyia coarctata Mgn.
Pegomyia bicolor Wdm.

SCIOMYZIDÆ.

Dryomyza anilis Fln.
Dryomyza flaveola F.
Tetanocera robusta Lw. One female. This species is not in Verrall's list. It was said by Dr. Meade to be closely allied to *T. ferruginea* Fln.

MICROPEZIDÆ.

Calobata cibaria L.

NOTE—FLOWERING PLANTS.

Bog-Pimpernel and Greater Spearwort at Woodhall Spa.—In July 1898, as I was walking across a bare and unpromising-looking pasture to inspect a newly-planted osier bed, I unexpectedly came across several patches about a yard across of the Bog-Pimpernel (*Anagallis tenella* L.). I knew it grew on the adjoining moor in small quantities, but to find it here was quite a surprise. The general shape of the patches was round, so that the plant, no doubt, spreads from a small centre. It was a cloudy, stormy day, and the flowers were not much open; they looked like a quantity of pinkish grain or small shells scattered on the ground. The Greater Spearwort (*Ranunculus Lingua* L.) was fairly plentiful at the edge of a pond that same year.—A. E. Jarvis, 65, Avenue Brugmann, Brussels, April 1900.

NOTES—ORNITHOLOGY.

Colour-Variety of Wheatear near Harrogate.—On Easter Monday, 16th April, I saw a very beautiful Wheatear (*Saxicola œnanthe*) near Spruisty Bridge, Bilton.

It was almost pure white with the exception of the wing shoulders, which were a bright terra-cotta.

There were a pair together, and I think the specimen under notice was the male.—KENNETH MACLEAN, Harrogate, 21st April 1900.

Pied Rook near Harrogate.—I noticed a very peculiar pied specimen of the Rook (*Corvus frugilegus*) exhibited in a barber's window at Knaresborough in March. It had been shot in the Crimple Valley, near Pannal.

The back of the head and neck was quite grey like that of a Jackdaw; the wings were splashed and speckled all over with white, whilst the base of the beak was covered with feathers as in the Carrion Crow (*C. corone*); indeed, the head was so much like the Crow's that I am inclined to think it was a hybrid.—KENNETH MACLEAN, Harrogate, 21st April 1900.

Hooded Crow Nesting near Horncastle.—An unusual occurrence is the following:—The Hooded Crow (*Corvus cornix*) breeds regularly in Iceland and in the North of Scotland, where it is not migratory, but a permanent resident. Mr. Brogden, in his 'Birds of South Lincolnshire' ('The Naturalist,' January 1900), says it 'occasionally breeds here,' but gives no case of this. Last April (1899) a pair were observed to pair and make a nest in the parish of Market Stainton, near Horncastle. One of these was shot by a farmer's son, W. Hyde, jun., and he also secured the eggs.—J. CONWAY WALTER, Langton Rectory, Horncastle, 13th April 1900.

Cranes in Lincolnshire about 1815.—About the year 1855 I was told by Jonathan Johnson, a cottage farmer at Rigsby, my birthplace, that when he was a young man (about 1815) the last flight of Cranes (presumably *Grus grus*) in that part of the county occurred at Gayton-le-Marsh. He used to visit that parish, which is about five miles from Rigsby, courting the girl who was afterwards his wife. It is worth noting that Johnson spoke of the occurrence as 'a flight of Cranes,' which is the true technical term in sporting, as I understand it, although Dame Juliana Berners styles it 'An Herde of Cranys.' Herons he would have called 'Herinsews.'—JAS. EARDLEY MASON, 27, Cheviot Street, Lincoln, 17th April 1900.

Feeding Habits of the Greenfinch.—Woodhall Spa, 9th August 1898. This morning I watched from my window a Greenfinch (*Ligurinus chloris*) feeding on the seeds of *Tragopogon pratensis* L. var. *minor*, which grew close to the house and under the window. It worked in the most methodical manner at a head of pappus, picking off each seed, and nibbling it, until the pappus was nipped off. It finished every seed, even to a loose one which had alighted at a little distance, but within reach of its bill. It then turned its attention to the heads of unripe seeds, still enclosed in the green involucre, tearing a hole in the side, and extracting the seeds one by one. The bird was a small specimen, perhaps a young one.—A. E. JARVIS, 65, Avenue Brugmann, Brussels, April 1900.

The Cuckoo.—Perhaps I may be allowed to supplement Mr. Peacock's excellent study of the Cuckoo (*Cuculus canorus*) by mentioning that I have seen a Wagtail standing on the *head* of a Cuckoo almost full grown, in order to reach its mouth with food, and that the Cuckoo never ceased shrieking all the time the Wagtail ran up and down the lawn in search of food; sometimes doing so seated on the edge of a sunk fence, at others following the Wagtail with two or three hops and a short flight. On this occasion there were two young Cuckoos, each attended by a Wagtail. These notes were made at Hatton, near Wragby, Lincolnshire, in July 1882.

A Lincolnshire lady, who had a house in Phillimore Gardens some years ago, once enjoyed the interesting sight of a young Cuckoo being fed by a Wagtail. The birds probably came from the garden of Holland House close by.—A. E. JARVIS, 65, Avenue Brugmann, Brussels, April 1900.

BIRD-NOTES FROM LEA, NEAR GAINSBOROUGH: JANUARY TO JUNE 1899.

Miss MARGARET L. ANDERSON,
Lea Hall, Gainsborough.

The country about Lea, though it is all flat enough, falls naturally into two strongly-marked divisions, viz., the low land lying next the river Trent on the extreme western border of the county, and the country of arable land and woodlands, sloping gradually from thence up to the line of villages of which Stow is the chief, and still further eastward to what, I believe, is called 'the cliff' by Lincolnshire folk. From Knaith, which is a picturesque village on the river bank about two miles to the south of Lea, the Trent takes an abrupt curve outwards and in again to Gainsborough, enclosing a great sweep of flat meadow land intersected with dykes, which is known as Lea Great Marsh. This tract of country, which is often entirely flooded in winter or at the spring tides, has an ornithology of its own, and I shall often have to refer to it.

The three woods on the higher ground to which I shall have occasion most frequently to refer, are Lea Wood, a big oak wood where a Woodcock may generally be found in winter; the Amadam or Hermit dam, a dyke-surrounded wood, part fir plantation and oak, part blackthorn scrub—in which portion a pair of Nightingales is to be found every May—and part rough, rushy, brambly ground, with small ditches cut across it, and an occasional tiny larch or fir, where, on 30th April, 1895, I heard and watched a Grasshopper Warbler for some time, the only occasion where I have seen or heard of it in this part of the country.

The third wood is Norbury Hill, planted by the late Sir Charles Anderson on ground, which in those days was Lea Common, as one tiny bit of ground tufted with heather in the middle of the wood attests. The lower part of this wood being on peaty, boggy soil, rhododendrons grow and flower there in masses among the birches and alders. The rest of the wood is chiefly oak, with in the highest part a thick plantation of large firs, where certainly in 1898, and probably in 1899, a pair of Herons nested in a big larch. Two or more of these splendid birds habitually roost in these thick firs, and are commonly to be put out of their tops, from whence they must be able to distinguish the river and the marsh meadows, where they may often be seen fishing in the dykes and shallow flood pools.

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The country I describe is all in the parish of Lea, in Division 5 W. of Mr. Peacock's Map of Lincolnshire; Knaith and Stow are in District 6 W. The scientific names are mainly in accordance with the B.O.U. List of British Birds.

1899. 16th Jan. A great deal of water in Lea Great Marsh, and large flocks of Lapwings (*Vanellus vanellus*) and a good many Ducks, Mallards (*Anas boschas*).

17th Jan. Some Redpolls (*Linota rufescens*) in alders at Norbury Hill.

25th Jan. Saw a fine pair of Hawfinches (*Coccothraustes vulgaris*) in the garden.

26th Jan. Heard the drumming spring call of the Lesser Spotted Woodpecker (*Dendrocopus minor*).

27th Jan. More water out in the Marsh. A flock of Golden Plovers (*Charadrius pluvialis*) and quantities of Duck feeding.

2nd Feb. Put a Jack Snipe (*Limnocryptes gallinula*) out of a tussocky field in the Marsh.

8th Feb. Watched a Tree Creeper (*Certhia familiaris*) and noticed its loud, clear, wren-like song, which has remained unnoticed in many ornithological works.

14th Feb. Watched some Marsh Tits (*Parus palustris*) up at Lea Wood.

19th Feb. Saw three Bullfinches (*Pyrrhula pyrrhula*), a cock and two hens, together. I have seen them several times before —always together.

21st Feb. Heard the Stock Doves (*Columba œnas*) cooing for the first time. An old lady in Lea village tells us that the Ring Dove's cry, instead of the familiar 'Take two cows, Taffy,' says 'Grew peas, grew! Two sticks on a boo (bough); other birds lays five eggs, poor me only two.' Bad grammar, but a bit of practical knowledge, all the same.

25th Feb. Heard the Ring Dove (*Columba palumbus*) coo for the first time.

5th March. Pied Wagtail (*Motacilla lugubris*) arrived.

10th March. Lapwings (*Vanellus vanellus*) paired, and Redshanks (*Totanus calidris*) arrived in the Marshes.

12th March. Heard a Starling (*Sturnus vulgaris*) exactly imitate the Lapwing's cry.

14th March. I watched a Missel Thrush (*Turdus viscivorus*) drive a Jackdaw (*Corvus monedula*) away from its nest in a Scotch fir. Its attack was most determined, and it struck at the Daw in the air just like a Hawk, so that the feathers flew.

15th March. The Robin (*Erithacus rubecula*) has begun to rebuild its nest in an old sieve in the potting shed.

19th March. First Thrush (*Turdus musicus*)'s eggs. A change in the weather, which had been mild and spring-like, and became bitterly cold.

23rd March. After six days' snow a Woodcock (*Scolopax rusticola*) was put up in the garden.

25th March. Watched a Greater and a Lesser Spotted Woodpecker (*Dendrocopus major* and *D. minor*) in the same tree for some time. A splendid opportunity for comparing their size. They seemed very tame. Saw a Lapwing (*Vanellus vanellus*) with a broken leg on a fallow.

20th April. Swallows (*Hirundo rustica*) first seen, but could not find out when the Chiffchaff (*Phylloscopus rufus*) was first heard. Found two or three Lapwings' nests. Saw two Snipe (*Gallinago gallinago*).

23rd April. Cuckoo (*Cuculus canorus*) first heard. Hedge Sparrow (*Accentor modularis*)'s nest with eggs. Oxeye Tit (*Parus major*) building in the old pump.

26th April. Starling (*Sturnus vulgaris*) with eggs.

27th April. Longtailed Tit (*Acredula rosea*)'s nest found at the Amadam.

29th April. Heard a Nightingale (*Daulias luscinia*) for the first time last night.

2nd May. Found a Wren (*Troglodytes troglodytes*)'s nest. Saw a party of ten Fieldfares (*Turdus pilaris*) at Lea Wood. A Pied Wagtail (*Motacilla lugubris*) building in the ivy opposite the dining-room window. The butler saw either a Sparrow Hawk (*Accipiter nisus*) or a Cuckoo (*Cuculus canorus*) sitting on a hencoop close to the Wagtail's nest in the afternoon.

7th May. The Oxeye in the pump has three eggs, which it covers up carefully before leaving them. A Chiffchaff (*Phylloscopus rufus*) building in the top of a little holly hedge, about two and a half feet or more from the ground. The nest is in a perfectly bare part of the hedge, in a dead branch, and built of dry, bleached holly leaves. Young Robins (*Erithacus rubecula*) nearly ready to fly.

8th May. The first Swift (*Cypselus apus*) seen, and a Blackcap (*Sylvia atricapilla*) singing.

16th May. Heard the Turtle Dove (*Turtur turtur*) for the first time and saw the first Spotted Flycatcher (*Muscicapa*

grisola). The Swifts (*Cypselus apus*) appeared again this morning. I have never seen them since the 8th, it has been so wet and cold. Starlings (*Sturnus vulgaris*) hatched.

24th May. A Swift (*Cypselus apus*) found lying on the gravel in front of the house by the gardener this morning. It could not rise, and died at night. The Robin (*Erithacus rubecula*) which has reared one brood in a nest in a little wooden house on the potting shed, is laying again in the same place.

26th May. Heard of a Kingfisher (*Alcedo ispida*)'s nest in the brickwork of the landing-stage at Knaith; the first I have ever heard of about here. Unfortunately the Trent, which is abnormally high just now, has risen above the hole, so that this attempt will come to nothing, and I fear the birds will be driven away.

30th May. Had a splendid day's birds' nesting with a collecting friend. Found nests of Hedge Sparrow (*Accentor modularis*), Chaffinch (*Fringilla cœlebs*), Greenfinch (*Ligurinus chloris*), Long-tailed Tit (*Acredula rosea*), Greater Whitethroat (*Sylvia sylvia*), Garden Warbler (*S. hortensis*), Willow Wren (*Phylloscopus trochilus*), Wood Pigeon (*Columba palumbus*), and heaps of Blackbirds' (*Turdus merula*) and Thrushes' (*T. musicus*). One of the Hedge Sparrows' nests was tenanted by a very young Cuckoo (*Cuculus canorus*) and two addled eggs. The Long-tailed Tits' was full of nearly full-fledged dead young ones. One old Blackbird was sitting hard on a very elementary nest with nothing in it.

31st May. Visited the breeding-place of the Black-headed Gulls (*Larus ridibundus*) at Twigmoor, near Brigg—a splendid sight. The Gulls were mostly sitting, a good many just hatching, some quite small young, and a few big ones. My friend got a good series of nine eggs, including one tiny one, which, but for its blunter shape, might have passed for a Snipe's. Two Coot (*Fulica atra*)'s eggs were also obtained, and a pair of Sheldrakes (*Tadorna tadorna*) noted, which must have had young close by, to judge from their anxious movements. The grounds of Scawby Hall were also visited, where we put a Hawfinch (*Coccothraustes vulgaris*) off her nest in the top of a young holly, quite un-get-at-able.

1st June. Again nesting in Norbury Hill. Found a Bullfinch (*Pyrrhula pyrrhula*)'s nest with eggs and another Garden Warbler (*Sylvia hortensis*)'s in some nettles; also a Chiffchaff (*Phylloscopus rufus*)'s nest, perfectly round and made of dead

oak leaves. It was very conspicuous, being placed in a kid or bundle of dead fir boughs, which had been flung down in a perfectly bare, open spot in a fir plantation.

2nd June. Down the Marsh. Saw Whinchats (*Pratincola rubetra*), Ray's Wagtails (*Motacilla raii*), and Reed Buntings (*Emberiza schœniclus*), but failed to find their nests. Put an old Lapwing (*Vanellus vanellus*) off four very handsome heavily-marked eggs in a hayfield. Up to Lea Wood. Identified another Garden Warbler (*Sylvia hortensis*)'s nest and eggs, and a Greater Whitethroat (*Sylvia sylvia*)'s. Coming back along the G.N.R. found a Chaffinch (*Fringilla cœlebs*)'s nest with blue unmarked eggs, also what we thought was a Chiffchaff (*Phylloscopus rufus*)'s nest, built in the middle of the thick hawthorn hedge about three feet from the ground. It was a domed nest, small and neat, built of dry grass and lined with feathers, and contained two dark reddish-brown eggs, almost exactly like those of a Titlark or Meadow Pipit. They were deserted, and on blowing proved to have been laid some little time. I hoped they were Tree Sparrow's eggs, as the place was some distance from any house, but fear they must be put down as the product of an eccentric House Sparrow (*Passer domesticus*).

3rd June. Nested in the Amadam. Found two Brown Linnet (*Linota cannabina*)'s nests, and another Long-tailed Tit (*Acredula rosea*)'s, also full of dead young. Found a Blackcap (*Sylvia atricapilla*)'s nest and identified the bird, also a Greater Whitethroat (*Sylvia sylvia*)'s. Saw a Sedge Warbler (*Acrocephalus phragmitis*), and a brood of young Water Hens (*Gallinula chloropus*) leaving their cosy-looking nest, and found another Water Hen's nest with three eggs. Got a Stockdove (*Columba œnas*)'s egg in the garden.

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oak leaves. It was very conspicuous, being placed in a kid or bundle of dead fir boughs, which had been flung down in a perfectly bare, open spot in a fir plantation.

2nd June. Down the Marsh. Saw Whinchats (*Pratincola rubetra*), Ray's Wagtails (*Motacilla raii*), and Reed Buntings (*Emberiza schœniclus*), but failed to find their nests. Put an old Lapwing (*Vanellus vanellus*) off four very handsome heavily-marked eggs in a hayfield. Up to Lea Wood. Identified another Garden Warbler (*Sylvia hortensis*)'s nest and eggs, and a Greater Whitethroat (*Sylvia sylvia*)'s. Coming back along the G.N.R. found a Chaffinch (*Fringilla cœlebs*)'s nest with blue unmarked eggs, also what we thought was a Chiffchaff (*Phylloscopus rufus*)'s nest, built in the middle of the thick hawthorn hedge about three feet from the ground. It was a domed nest, small and neat, built of dry grass and lined with feathers, and contained two dark reddish-brown eggs, almost exactly like those of a Titlark or Meadow Pipit. They were deserted, and on blowing proved to have been laid some little time. I hoped they were Tree Sparrow's eggs, as the place was some distance from any house, but fear they must be put down as the product of an eccentric House Sparrow (*Passer domesticus*).

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NOTE—AMPHIBIA.

Natterjack Toad at Seascale.—Whilst at Seascale, on the coast of Cumberland, my son caught on the railway a small Natterjack Toad (*Bufo calamita*); this was on the 12th September inst. We brought it home with us. It is very interesting to see it run; its mode of progress is quite distinct from that of the ordinary Toad or the Frog. Is this a new record?—JOHN FARRAH, Jefferies' Coate, Harrogate, 25th September 1899.

NOTE—CONCHOLOGY.

***Helix lapicida*, etc., near Grassington.**—At Easter this year I found this species commonly in the crevices of the limestone rocks of the escarpment on the north side of the Wharfe near Grass Wood, Grassington. *H. nemoralis* was also common there.

I also found the white variety of *H. ericetorum* on the river bank below Linton Falls.—[Mrs. H. G.] BRIERLEY, Huddersfield, 12th May 1900.

COLLECTING DIPTERA: A FEW USEFUL DODGES.

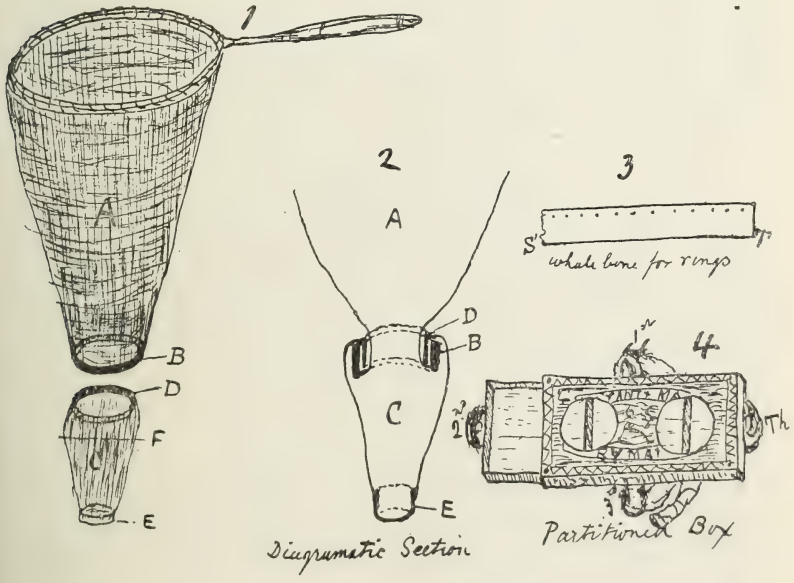
Rev. W. J. WINGATE,
St. Peter's Vicarage, Bishop Auckland.

A Net with a Window.—The Diptera are my hobby and often when sweeping one gets a score or two, sometimes a hundred or two, of buzzing excited flies in a single sweep of the net. As many of them will generally be very small, and most of them require close examination, I found it impossible to know what I had got by merely looking into the net, so I had a transparent celluloid watch-cover sewn into the end of my net which allows the catch to be examined even with a lens by holding any particular fly gently against the celluloid with the slack of the net. It also enables you to see exactly what you are doing in getting a particular fly into the killing-bottle.

Simple Pocket Killing Bottles.—For field killing bottles I use small wide-mouthed bottles (about 4 inches high with a mouth one inch in diameter), and still smaller ones for 'small fry.' At the bottom I put a few discs of blotting paper pressed in tightly and a sheet of the same round the inside to keep the insects off any moisture condensed on the glass. Two or three drops of benzine dropped in once or twice a week make a deadly atmosphere for any Diptera or Hymenoptera. I am never without such a bottle in my pocket, for I find windows, doors, and walls most productive, and have often caught a good fly on a house door when visiting before my knock was answered. Very often the best things turn up when you don't expect them.

Simple Nets with Removable Ends.—But I found that the examination through the celluloid window was not enough, and there was no time on the field to examine scores of living flies, so I adopted the plan of putting the end of the net, with the flies, into a sponge bag, into which a few drops of benzine or chloroform had been dropped, and when reduced to quiescence putting all the captures into a pill-box for home examination. But that took much time, and it was not easy to get the haul out of the net safely, especially if there was wind. So I have adopted the following, which I find a very great success. A is the muslin net. Cut a little portion off the small end where the diameter measures about four inches. Make a ring of whalebone out of the strips to be got at any drapers, a quarter of an inch broad, and with a shoemaker's awl bore a row of needle holes along one side (Fig. 3). Form it into a ring three inches

in diameter, and sew the open end of the net on to it in such a way that the edge S.T. will be free and *outside* the net (see Fig. 2), and pointing upwards. Then make a number of little bags about seven or eight inches long with a celluloid watch cover at the smaller end E, and another whalebone ring D at the other. This ring must be a little smaller than B so as to fit loosely inside it, and the free edge of the whalebone must be *inside* the bag (see Fig. 2), and pointing downwards. Now by slightly compressing B you can pass the larger ring through the smaller into the bag, and fit it round the outside of the small ring (see Fig. 2), joining the bag C quickly and firmly to the net A,



and giving an easy entrance from A to C, but a less easy exit from C to A. Then I have a tin with an air-tight lid, like a pound paint tin, only twice as long—mine is an old toffee tin—the inside and bottom covered with two or three sheets of blotting paper on which are dropped 10 or 12 drops of benzine. The flies are swept into C, which is compressed about F with the left hand to prevent their exit. B is pressed inwards and then pulled sideways through D, and the bag with the flies in it detached, popped into the benzine tin and another bag like C —I carry four or five in my pocket—is attached to the net. The whole operation scarcely takes a minute. And another great

advantage of the detachable end is that if, as often happens in sweeping when thorns are about, a bag is torn, it is easy to put on a fresh one. A tear in the upper part of the net, if not too large, does not much matter, near the end it is fatal, but with detachable bags all is well.

Easily-Manipulated Boxes.—Instead of the ordinary glass-topped boxes, which are not very easily manipulated with one hand without a good deal of practice, I use old match-boxes, with a partition glued across the middle, and a couple of ¾-inch holes punched in the top and covered with a strip of mica (Fig. 4). Open the match-box half-way. Hold it between the side points of the first and third fingers with the thumb and first fingers at each end ready to close it when the open portion has been placed over an insect. It can then be opened half-way on the other side to receive another occupant, the first side remaining closed on its prisoner.

NOTE—LEPIDOPTERA.

***Gonepteryx rhamni* in Nottinghamshire.**—On 18th April, during a cycle ride from North Collingham to Spalford in mid-east Notts, I saw seven specimens of the Brimstone Butterfly on the wing. Three were in the parish of North Collingham, three at South Scarle, and one at Spalford. We may, therefore, hope to see this beautiful species commonly in the district in the late summer, although it is usually rare in Notts. I may add that I saw two specimens at Thorney, in the same neighbourhood, early in August last.—J. W. Carr, Nottingham, 5th May 1900.

NOTE—ORNITHOLOGY.

Curious Site for a Blackbird's Nest.—At the railway station of Netherton, a village three miles from Huddersfield, a pair of Blackbirds (*Turdus merula*) have chosen a curious site for their nest. The low front of the station is supported in the centre by an iron pillar, at the top of which, in front and outside, is a projecting ledge. On this ledge the birds have built their nest, and have now been closely sitting for some days. The nest is near the booking office and in perhaps the busiest part of the stone-built station, with trains constantly passing or stopping immediately opposite the nest at only a few yards distance for numerous passengers to enter or depart. But what adds to the remarkable character of the site is the fact that a large station lamp, similar to an ordinary street lamp, is fixed to the iron pillar, the lamp itself projecting in front of, and on a level with, the nest, a space of about half a yard separating them. To get to the nest the birds have practically to go around the lamp, and, although it is lighted as usual every night, and the nest and sitting bird are fully exposed to the view of every passenger by the trains, the birds evince no fear whatever. The station-master and porters are much delighted with the birds and nest, and I believe will not allow them to be molested if they can help it. I may add, too, that as the nest is about a mile from my own residence, and as I pass it in the train several times daily, I also shall watch its future career with much interest.—Geo. T. Porritt, Crosland Hall, Huddersfield, 25th May 1900.

CHANGES IN THE HALIFAX FLORA DURING THE LAST CENTURY AND A QUARTER.

C. E. MOSS, B.Sc.

In the following article I propose to consider the question of the changes that have taken place in the flora of Halifax since 1775 A.D. The parish of Halifax is well adapted for such a study. It possesses almost continuous records from 1775 until the present time: it covers a moderately extensive area; and it is a fairly natural division.

The first list of Halifax plants, which can claim to be at all representative, appeared in Watson's 'History of Halifax' in 1775. The list is usually attributed to James Bolton, author of 'British Funguses,' etc.; but the evidence on which this idea is based is not absolutely convincing. The list is a peculiar one in many ways. Very common plants are nearly always omitted, and yet Chickweed and Shepherd's Purse are localised with great particularity. The author confines his attention to small fry, there being few records for large shrubs, and none for forest trees. Rushes and sedges are almost ignored, and the grasses entirely so—because, one suspects, he was not cognisant of these types. The records are nearly all of perennial, herbaceous plants; and of these he appears to mention all the rarities he knew. Though some of his entries are startling, and others erroneous, yet his bona-fides cannot be questioned, nor the value of his list doubted. We must remember the limitations of his time, that his flora—he used Hudson's—was itself often in error, and that the occurrence and distribution of many British species were very imperfectly known. At the same time, it must be confessed that a little—a very little—more care in examination would have prevented such mistakes as *Colchicum* for the true Crocus and the stemless Thistle for *Carlina*.

After Bolton came several workers who have contributed to a knowledge of the Halifax flora, chief of whom are Leyland, Gibson and King. The local Scientific Society is continuing the work, and I must refer those who desire a more detailed knowledge than a short paper can give of Halifax botany and botanists to the flora now in course of publication.*

* 'The Flora of Halifax,' by W. B. Crump, M.A., is now appearing in serial form in 'The Halifax Naturalist.'

1900 June 1.

I take it that the following species in the list, which I shall assume to be Bolton's, are errors: the plant which I think Bolton actually had in mind I also give.

Plant Mentioned by Bolton.	Plant I Think He Meant.
'32* *Œnanthe fistulosa.'*	*Œnanthe crocata* L.
'42 *Colchicum autumnale.'*	*Crocus nudiflorus* Sm.
'82 *Potentilla argentea.'*	? *Potentilla reptans* L.
'141 *Trifolium subterraneum.'*	? *Trifolium dubium* Sibth.
'143 *Hypericum montanum.'*	? *Hypericum quadratum* Stokes.
'145 *Lactuca saligna.'*	? *Lactuca muralis* Fr.
'150 *Carduus acaulos.'*	*Carlina vulgaris* Benth.
'168 *Orchis ustulata.'*	? *Habenaria conopsea* Benth.
'169 *Orchis militaris.'*	? *Habenaria viridis* R.Br.
'180 *Salix reticulata.'*	? *Salix aurita* L.
'191 *Acrostichum* [*Lastræa*] *thelyptere.'*	*Lastræa Oreopteris* Presl.

Bolton seems to have been misled by Hudson's Flora in the case of the first two and the last of these records. Of the rest, excepting *Carlina,* there will always probably remain some doubt as to what precisely was meant. The grounds on which I base my opinions are in many cases irrelevant to the immediate purpose in hand; where not so I give them further on.

It is likewise desirable to point out the introduced plants, as it is difficult to draw significant conclusions from such plants. They are introduced either on account of their beauty or their medicinal virtue—supposed or real—while they are often soon eradicated for precisely the same reasons.

The following introductions now appear to be extinct:—'19 *Polemonium cæruleum,*' '22 *Vinca,*' '37 *Narcissus poeticus,*' '51 *Daphne laureola,*' '87 *Chelidonium majus,*' '124 *Geranium perenne*' = *G. pyrenaicum* Burm. fil., '64 *Viola odorata*'; while '70 *Sempervivum tectorium*' and '118 *Cochlearia armoracia*' remain in suspicious stations.

The rest appear to be more or less probable natives or colonists, together with a few casuals which I shall ignore; and I now proceed to classify them in such a way as to offer matter for the elucidation of the question under discussion.

I. The first class includes those plants which have disappeared or almost disappeared since 1775, owing to the

* The numbers are those which appear in Bolton's list. I retain them to facilitate reference. The spelling is also Bolton's.

encroachments of the town and surrounding villages, many of which are in fact small towns themselves.

It will be observed that most of these plants belong to Watson's 'English' type, which in Halifax are as a rule only found at the comparatively low levels on the east of the town. It is natural that these should be the first to disappear and the greatest sufferers, as the low-lying districts are early built upon, the more elevated districts being occupied later, when at all.

'1 *Hippuris vulgaris.*' Bolton's is the only record; and the plant is one of the very few aquatic types that have disappeared.

'13 *Sagina erecta*' = *Cerastium quaternellum* Fenzl. Again the only record. The stations given are quite near the town and are now mostly built upon, thus differing from Salt's Sheffield station.

'20 *Verbascum lychnitis.*' See Lees' remarks in 'Flora of West Yorkshire.' I do not quite understand what Bolton means by 'dry pastures the year after they have been fallow.'

'65 *Lythrum salicaria,*' '68 *Euphorbia exigua,*' '86 *Comarum palustre,*' '95 *Thalictrum flavum,*' '98 *Nepeta cataria,*' '106 *Origanum vulgare,*' '108 *Melissa calamintha,*' '112 *Orobanche major*' and '131 *Genista tinctoria*' are all unknown now.

'137 *Ornithopus perpusillus.*' Apparently common about Skircoat until Skircoat Moor was converted into Savile Park. There are scores and scores of specimens in the old, local herbaria!

'145 *Lactuca saligna.*' It is usually assumed that Bolton meant *L. muralis* Fresen.; though it is quite possible that, in the days of pack horses and pack wagons, *L. saligna* Linn. should be found growing casually 'in a lane.'

'150 *Carduus acaulos*' = *Carlina vulgaris* Linn., '159 *Senecio erucifolius*' and '161 *Inula dysenterica*' seem to be absent now.

'173 *Typha angustifolia.*' The only record. Probably introduced, like its broad-leaved relative was about fifteen years ago at Rishworth. Three hundred feet is an unusual altitude for the plant, and aquatics seem not to die off, but to increase, in Halifax, as I shall show further on.

II. This class includes those plants which have disappeared or almost disappeared from the moors and moor-edges, which, chiefly on the north and west, occupy quite half of the whole Halifax parish. Even on the tops of the moors remotest from the town, destructive effects may be noticed due to smoke, largely

brought over from Burnley and Rochdale by the prevailing west winds. The chief sufferers, however, among the moorland plants are those which inhabit wet places. Their disappearance is to be accounted for by the drainage of the moors, by the making of reservoirs at the heads of the cloughs, by the cultivation of heather to provide cover for the grouse, and by the tilling of the ground at the moor edges. The following have all disappeared through these causes:—'8 *Schœnus albus*' = *Rhyncospora alba* Vahl., '16 *Lysimachia tenella*' = *Anagallis tenella* Linn., '36 *Drosera longifolia*,' '171 *Ophris cordata* = *Listera*,' '174 *Carex dioica*,' '183 *Myrica gale*,' '184 *Juniperus communis*,' 198-200 *Lycopodium clavatum, L. alpinum, L. Selago.*

The disappearance of two species can positively be accounted for by the increase of tillage.

'25 *Campanula hederacea*' remained in Cob Clough in pretty much the same condition from 1775 to 1898. On visiting the station in September of the latter year I found that of two, undrained rough pastures in which it was abundant, one had been drained and manured for the growth of hay, and the other, wet, rocky, and heathery though it had previously been, had been ploughed and converted into a field of oats. Only a very little of the plant now remains.

'30 *Athamanta meum*' = *Meum Athamanticum* Jacq. King (1844) states that the field in which it formerly grew had been ploughed to grow potatoes. He appears to have taken the only specimen which was left!

Just as most of the lowland types which have disappeared near Halifax belong to Watson's 'English' type, so most of the moorland species which have gone belong to his 'Scottish' type, a type of plant in which Halifax is rather rich.

III. Here I include those plants which have almost disappeared owing to the depredations of pedestrians, herbalists, gardeners, and naturalists. These are mostly either ferns or plants with showy flowers, or plants of some rarity:—'40 *Convallaria majalis*,' '53 *Paris quadrifolia*,' '55 *Pyrola minor*,' '189 *Osmunda regalis*,' and many others.

It is perhaps worthy of note that none of these are quite extinct, though most of them from being abundant have become very rare. I have good authority for saying that one florist has recently been responsible for the extermination of the Beech Fern in Bogden Clough, Rishworth; and that another has well-nigh eradicated two species of Forget-me-not (*Myosotis palustris* and *M. sylvatica*) from Elland Park Wood. All three plants

were abundant in the stations named before they received the attentions of these tradesmen. I am also credibly informed that a certain local landowner is responsible for the disappearance of the Snowdrop from many fields in the Luddenden Valley. The 'pilgrimages' which some local naturalists' societies annually make to the haunts of *Trientalis, Pyrola, Andromeda, Paris,* and other local rarities are highly reprehensible; and they have, to my personal knowledge, been responsible for the great diminution in numbers of many of these plants.

IV. This is an interesting class, and includes those plants which were, so far as one can judge, rare in Bolton's time, and which are in pretty much the same condition to-day as they were in his time.

The plants of the narrow, western cloughs represent those which have changed the least, as villages are rare in them owing to difficulties of transport. Mills, too, are scarce amongst them, hence the rapid clough streams are not contaminated with much sewage or mill-refuse. Moreover, these cloughs, by their great depth and narrowness, are somewhat sheltered from the smoke of the towns. Where clough plants have disappeared it is almost always owing to the draining of those portions which abut on the moors, or to the depredations of trippers in places like Hardcastle Crags.

Considerations of this nature support what I early stated, that Bolton made an error in recording *Œnanthe fistulosa* for the cloughs throughout the parish. *Œ. crocata* is the plant there now; and if we assume that this was the plant intended, the record is in keeping with the general conclusion arrived at, viz., that the plants in the cloughs in 1775 are the same as those in the same places to-day. If Mr. Lees* wishes us to believe that *Œ. crocata* has displaced *Œ. fistulosa* he must show how it is possible that the causes effecting such a remarkable substitution of one species for another have not affected other plants in the same areas. The following species may be taken as typical of the clough plants recorded by Bolton which have maintained their respective habitats:—'5 *Pinguicula vulgaris,*' '7 *Iris Pseudacorus,*' 32 *Œnanthe crocata,* sub nomine '*Œnanthe fistulosa,*' '61 *Stellaria nemorum,*' '93 *Trollius Europæus,*' '120 *Cardamine amara,*' '149 *Carduus helenoides*' = *Cn. heterophyllus* Willd., '167 *Orchis bifolia*' = *Habenaria bifolia* R.Br. and '181 *Salix rosmarinifolia*' = *S. repens* Linn.

* 'The Naturalist,' February 1900.

Again, some of the rare moorland plants, which inhabit the drier places, have withstood the smoke, and the firing of the moors. Of these the most noticeable are:—'43 *Trientalis Europæa,*' '79 *Rubus chamæmorus,*' and '132 *Genista anglica.*'

It is significant that practically all the rarities mentioned by Bolton, which survive at all, survive in the identical stations mentioned by him. This fixity of station is a fact which goes dead against Lees' interpretation of the natural changes which species undergo in a given area. The following plants mentioned by Bolton are still in the exact localities named by him:—

'25 *Campanula hederacea,*' '41 *Narthecium ossifragum,*' '42 *Crocus nudiflorus,*' '43 *Trientalis Europæa,*' '55 *Pyrola minor,*' '56 *Andromeda polifolia,*' '79 *Rubus chamæmorus,*' '93 *Trollius Europæus,*' '107 *Thymus serpyllum,*' '132 *Genista anglica,*' '166 *Viola lutea*' and 181 *Salix repens.*

V. This class includes plants belonging to the type usually recorded by Bolton, but actually not mentioned in his list, because, I think, he overlooked them. The following are the chief:—

Vicia sylvatica, 1820;* *Arctostaphylos Uva-ursi,* 1666; *Veronica scutellata,* 1832; *Neottia Nidus-Avis,* 1878; *Habenaria chloroleuca,* 1838; *Tamus communis,* 1831; *Geranium sylvaticum,* 1892; and *Epilobium roseum,* 1895.

VI. This is perhaps the most remarkable class of all, including plants which have in all probability appeared since Bolton's time. They are practically all aquatics, and their recent introduction is due to the making of canals and the increase of suburban mill-dams. Perhaps some of them existed in the Calder before the making of the various parts of the canal (1758, 1794, 1825), as the river would then be comparatively unpolluted by sewage and mill-refuse; but a river like the Calder, with a strong current and liable to spates and floods, probably never provided a home for floating types like *Sagittaria* and *Potamogeton eu-natans,* and submerged species like *Zannichellia* and *Potamogeton pusillus*; though river-side plants such as *Glyceria aquatica* and *Epilobium hirsutum* no doubt occurred. The following are the chief of this class:—*Nasturtium amphibium* R.Br., *Lysimachia vulgaris* L., *Polygonum amphibium* L., *Ceratophyllum demersum* L., *Elodea canadensis* Michx., *Typha latifolia* L., *Sparganium ramosum* Huds., *S. simplex* Huds., *Acorus Calamus* L., *Lemna trisulca* L., *L. minor* L., *Sagittaria*

* I give the date of the first Halifax record.

sagittifolia L., *Potamogeton natans* L., *P. crispus* L., *P. obtusifolius* M.&K., *P. pusillus* L., *P. pectinatus* L., *Zannichellia palustris* L., and *Eleocharis acicularis* R.Br.

A few moorland aquatics were without doubt present before Bolton's time, such as *Potamogeton polygonifolius* Pour. and *Ranunculus Lenormandi* F. Sch.; and perhaps a few lowland aquatics too, such as *Alisma plantago-aquatica* L., though these are unrecorded by him.

Judging by the profuse aquatic vegetation in the Halifax canals and mill-dams, lowland aquatic types seem to be less affected by contamination of the medium in which they live than any other class of plants. This generalisation does not apply to those aquatics—few in number—which inhabit swift-flowing streams.

Thus far it may be seen that the changes noted in the Halifax flora may all be ascribed to artificial causes, which may be summarised as follows:—

1. Encroachment of towns and villages; pollution by smoke, sewage, etc.; the conversion of heaths into parks.

2. The drainage of the moors to supply the reservoirs; the increase of tillage on the moor edges; the systematic burning of the moors to supply grouse with cover, and the more casual burning by irresponsible people.

3. The depredations of trippers, herbalists, gardeners, and naturalists.

It has also been shown that those portions of the parish which have been least molested by man exhibit very little change at all; and that plants which have been observed only recently are mostly aquatics, and are consequent on the opening of the canal.

There are other artificial causes of change of plants, which do not appear to have been obtrusively operative in Halifax during the last 125 years.

At Woodlesford, near Leeds, the formation of hollows in the surface of the land due to the sinking of the roofs of mines, has resulted in the formation of pools of some considerable area; and a host of aquatics has appeared, where before the vegetation was quite terrestrial.

The felling of timber would cause a change from shade types such as *Scilla nutans* to plants more xerophilous in habit. In Halifax, however, it is not often that a whole wood is cut down at once, but only trees of a certain thickness, so that the general conditions of our woodlands remain unaltered.

The changes incident to tillage operations often bring about changes of flora; but, as arable land is rare in the Halifax parish, this factor is unimportant here. Corn-field weeds, and even hedge-row plants, such as the Poppy and the Crosswort, are quite rare in Halifax. As in most suburban districts, arable land has diminished rather than increased since Bolton's time, which cause accounts for the comparative disappearance of some plants common in his time, such as Crosswort.

Among natural agencies, physiographic factors, such as land-slips and floods, may have been operative to some extent; but all the evidence in my possession is against such causes being responsible for the introduction of fresh types; though I regard it as more than probable that in a few cases plants, e.g., *Pyrola,* may have been exterminated from particular stations by such agencies.

Then, again, birds are no doubt responsible for carrying seeds from one locality to another; but when, as is now of course usually the case, the seeds drop in places occupied by other adult plants it is not often that the seedlings of such plants will be able to oust adult and robust species. For example, although the spring Bluebell produces ripe seed in abundance, I have noticed that it is only in places unoccupied by other plants that the seedlings usually develop into adults. It is quite possible, however, that a few plants, of which I may mention *Geranium sylvaticum*, have been recently introduced into the Halifax district by this means.

My study of Halifax plants, then, has brought me to the conclusion that apart from obviously artificial causes, the changes observable in the flora of this area during the last century and a quarter are well-nigh negligible. This is so in regard to the introduction of new species, in regard to the extinction of established species, and even in regard to the change of habitat of such plants. Mr. F. A. Lees states* that 'the natural stay of species may be long or short,' but until the author of 'The Flora of West Yorkshire' gives positive evidence of a 'natural short stay' of some plants, I must regard such a phenomenon as highly exceptional.

NOTE—ORNITHOLOGY.

Nightingale at Lincoln.—A Nightingale (*Daulias luscinia* L., ♂) has taken up his abode in the Arboretum here, and on Friday, the 11th May, I both saw and heard him.—J. EARDLEY MASON, 27, Cheviot Street, Lincoln, 13th May 1900.

* 'The Naturalist,' Feb. 1900.

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GEOLOGY AND PALÆONTOLOGY, 1896.

THE present instalment has been compiled and edited by

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Previous instalments of the Bibliography of Geology and Palæontology have appeared as follows:—

For 1884,	in 'Naturalist,'	Dec. 1885, pp. 394-406.
,, 1885,	,,	Nov. 1886, pp. 349-362.
,, 1886,	,,	June 1888, pp. 178-188.
,, 1887,	,,	Feb. 1889, pp. 61-77.
,, 1888,	,,	April-May 1890, pp. 121-138.
,, 1889,	,,	Nov. 1890, pp. 339-350.
,, 1890,	,,	Oct.-Nov. 1891, pp. 313-330.
,, 1891,	,,	July-Aug. 1892, pp. 219-234.
,, 1892,	,,	Sept. 1893, pp. 265-279.
,, 1893,	,,	Sept.-Oct. 1898, pp. 273-296.
,, 1894,	,,	March-April 1899, pp. 81-103.
,, 1895,	,,	Oct.-Nov. 1899, pp. 305-324.

I have to thank Mr. W. Denison Roebuck, F.L.S., and Mr. Alfred Harker, M.A., F.G.S., for assistance.

Particulars of papers, etc., omitted from the following list will be gladly received and included at the commencement of the 1897 Bibliography. Every effort will be made, however, to ensure these lists being as complete as possible.

The lists for 1897-1899 will be published as soon as possible, and it would render them more complete if editors of periodicals, secretaries of societies, and especially authors of papers in local journals, etc., would send copies to the editor of this journal at 259, Hyde Park Road, Leeds. Reprints and authors' separate copies should bear the name of the publication, the number of the volume or part, the *original* paging and the *actual* date of publication.

As regards dating, we would suggest to Editors and Secretaries that care be taken to give on the wrapper the actual date of publication of all parts of journals and transactions; there is often difficulty and uncertainty, and we might instance some Transactions as not even stating the *year* of publication of the various parts. Bibliographers would greatly appreciate attention to this point.

1900 June 1.

The Watsonian vice-counties are adopted throughout these bibliographies as more convenient and uniform in extent than the political counties; those comprised within the North of England are the following:—

53, Lincoln S.; 54, Lincoln N.; 56, Notts.; 57, Derby; 58, Cheshire; 59, Lancashire S.; 60, Lancashire W.; 61, York S.E.; 62, York N.E.; 63, York S.W.; 64, York Mid W.; 65, York N.W.; 66, Durham; 67, Northumberland S.; 68, Cheviotland; 69, Westmorland with Furness and Cartmel; 70, Cumberland; and 71, Isle of Man; with their adjoining seas.

1895.

CHARLES J. MURTON AND SAVILLE SHAW. NORTHUMB. S.

A Deposit found at Delaval Colliery, Benwell, Northumberland. Trans. N. Eng. Inst. Mining Engineers, Vol. 45, 1895, pp. 67 et seq. **[not seen].**

SAVILLE SHAW. See 'Charles J. Murton.'

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HORACE B. WOODWARD. LINC. N. AND S.

The Jurassic Rocks of Britain, Vol. 5. The Middle and Upper Oolitic Rocks of England (Yorkshire excepted). Geol. Surv. Memoir, 8vo., pp. xiv.+499, 145 figures and map. London, 1895.

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[Discovery of Foraminifera in Boulder Clay from Hull]. Irish Naturalist, Vol. 4, Jan. 1895, p. 24.

1896.

ANON. [not signed]. YORKSHIRE, DERBYSHIRE, ETC.

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ANON. [not signed]. ? NORTHERN COUNTIES.

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Naturalist,

Club, ancient British earthworks, peat and glacial beds noted; Hessle on 5th July, visited chalk and glacial beds; Knaresborough on 14th July, with the Yorkshire Naturalists' Union, Permian and carboniferous rocks examined; Willerby on 28th July, chalk and glacial beds; Spurn and Dimlington on 4th Aug., with the Hull Scientific Club, sections in the purple and 'Basement' clays examined, and list of shells collected from the latter given; Drewton Dale and district on 6th Aug., with list of fossils from the Lower Lias and Kellaways Rock]. Trans. Hull Geol. Soc., Vol. 2, 1894-5, publ. 1896, pp. 9-15.

ANON. [not signed]. CHESHIRE.

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ANON. [query, P. F. Kendall, Editor]. YORK N.E. AND S.E.

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ANON. [Compiled by Assistant Librarian]. NORTHERN COUNTIES.

Geological Literature | added to the | Geological Society's Library | during the | Year ended December 31st, 1895. | (Compiled by the Assistant Librarian) | Geological Society | Burlington House. | London | 1896 | . . . | 157 pp. [Contains numerous references to papers, etc., referring to the geology of the northern counties].

H. H. ARNOLD-BEMROSE. DERBYSHIRE.

Discovery of Mammalian Remains in the Old River-Gravels of the Derwent near Derby. Part 1. [Several Hippopotamus bones, the breast bone of *Elephas,* and part of the tibia of Rhinoceros found in a dark-coloured sand whilst sinking a well at Allenton]. Quart. Journ. Geol. Soc., Vol. 52, Aug. 1896, pp. 497-500; abstracts in Geol. Mag., 1896, pp. 282-3; and Ann. and Mag. of Nat. Hist., June 1896, p. 468.
See also 'R. M. Deeley.'

J. B. ATKINSON. NORTHERN COUNTIES.

List of Mines in the United Kingdom of Great Britain and Ireland, and the Isle of Man, for the year 1895, prepared by Her Majesty's Inspectors of Mines. London, 1896 **[not seen].**

J. B. ATKINSON. NORTHERN COUNTIES.

Mineral Statistics of the United Kingdom of Great Britain and Ireland, with the Isle of Man, for the year 1895. London, 1896 **[not seen].**

J. B. ATKINSON. NORTHERN COUNTIES.

Summaries of Statistics relating to the Mines and Quarries in the United Kingdom and the Isle of Man. London, 1896 **[not seen].**

J. B. Atkinson. Northern Counties.

List of the Plans of Abandoned Mines deposited in the Home Office under the Coal and Metalliferous Mines Regulation Acts, including Plans transferred from the late 'Mining Record Office.' London, 1896 **[not seen].**

James Backhouse. York N.W.

Upper Teesdale, | Past and Present: | . . | . . | By | James Backhouse, F.L.S., F.Z.S., F.R.H.S., | . . | . . | . . | London | . . | . . | . . | 1896 | [Contains archæological and geological notes]. pp. vi. + 89. (Reviewed in the Naturalist, Dec. 1896, p. 366.)

M. F. de Montessus de Ballore. Northern Counties.

Seismic Phenomena in the British Empire [Northern England very briefly referred to]. Quart. Journ. Geol. Soc., Vol. 52, Nov. 1896, pp. 651-668 and maps.

F. Barke [Chairman]. Cheshire.

Section E.—Geology. | — | Chairman.—Mr F. Barke. | — | Report 1895-96 [notices excursion to Macclesfield, with list of 13 marine recent mollusca found in the drift at Clulow Cross; excursion to Mow Cop, Congleton Edge, etc.]. Ann. Rep. and Trans. North Staff. N. F. Club, for 1895-6, Vol. 30, pp. 79-80.

F. Barke [Leader]. Cheshire.

Excursions. . . II. Clulow Cross, Wild Boar Clough, and Forest Chapel. Thursday, May 16th [1895; geological observations]. Ann. Rep. and Trans. North Staffs. N. F. Club, for 1895-96, Vol. 30, pp. 129-131.

J. Barnes and W. F. Holroyd. Derbyshire.

The Mountain Limestone Caverns of Tray Cliff Hill, Castleton, Derbyshire, with some of their contained minerals [dealing with (1) Locality and geology of the district; (2) Description of the caverns: their history, shapes, sizes, peculiarities, mode of formation; (3) Stalactites, stalagmites, and anemolites; cave deposits; cave pearls; (4) Mineral Deposits: fluor-spar, galena, barytes; (5) History of the working of the mine for fluor; varieties of fluor; colours; causes of the colour; experiments to find colouring matter; and (6) Synthesis and production of artificial fluor-spar, in the following forms: crystalline and crystallised, colourless and coloured; with numerous plans and sections]. Trans. Manch. Geol. Soc., Vol. 24, Part 10, 1896, pp. 215-252.

J. Barnes. See 'W. F. Holroyd.'

T. Barron. Isle of Man.

On a New British Rock containing Nepheline and Riebeckite [found in Scotland; on p. 372 is the following:—Riebeckite has also been described by Professor Grenville A. J. Cole (Mineralogical Magazine, Vol. 11, 1891, p. 222), from eurite pebbles collected from the glacial drift of the Isle of Man]. Geol. Mag., 1896, pp. 371-378.

F. A. Bather. Yorkshire and General.

Zones of the Carboniferous [letter calling attention to the necessity of noting the exact horizon in the Carboniferous Limestone, etc., from which Crinoids and other fossils are obtained; regretting that the vast majority of such specimens in the national collection are simply labelled 'Carboniferous Limestone, Yorkshire,' or in a similar way]. Geol. Mag., Dec. 4, Vol. 3, Jan. 1896, p. 46.

Henry C. Beasley. Lanc. S., Cheshire.

An Attempt to Classify the Footprints in the New Red Sandstone of this [i.e., Liverpool] district [arranging the footprints found on the slabs of sandstone in groups in order to facilitate reference; examples are well shown on three plates which accompany the paper]. Proc. Liverpool Geol. Assn., Vol. 7, Part 4, 1895-6, pp. 391-410.

H. C. Beasley. Lanc. S., Cheshire.

Observations on Some of the Footprints from the Trias in the Neighbourhood of Liverpool [describes slabs with impressions of the feet of *Cheirotherium, Rhynchosaurus,* etc.]. Rep. Brit. Assn., 1896 (Liverpool Meeting), pp. 779-780.

A. Bell. Isle of Man.

Tertiary Deposits in North Manxland [endeavouring to show that the deposits of Northern Manxland are not Glacial, as usually supposed, but pre-Glacial]. Rep. Brit. Assn., 1896 (Liverpool Meeting), p. 783, and Glac. Mag., Vol. 4, Part 2, Sept. 1896, p. 87.

James Bennie [communicated by]. Isle of Man.

Arctic Plants and *Apus* Remains at Kirkmichael in the Isle of Man [gives extract from the Report of the Progress of the Geological Survey for 1895; records glacial plants (*Salix herbacea, Carex alpina,* etc.) and remains of *Apus* (*Lepiduras*) from a bed of peat at Kirkmichael]. Naturalist, Aug. 1896, p. 244.

Herbert Bolton. Lanc. S., Cheshire.

On the Occurrence of the Genus *Listracanthus* in the English Coal Measures [describes a spine of *L. spinatus*, sp. n. from the Lower Coal Measures, Lancashire . . . in the Royal Museum, Peel Park, Salford; and a small spine of *Listracanthus* sp. indet. from the Middle Coal Measures, Dukinfield]. Geol. Mag., 1896, pp. 424-6.

Herbert Bolton. Lanc. S.

The Geology of North-east Lancashire in its Relation to the Physical Geography. Trans. Manch. Geol. Soc., Vol. 24, 1896, pp. 56 et seq.; also Coll. Guard., Vol. 71, 1896, pp. 226 et seq.

T. G. Bonney. Northern Counties.

Ice-Work | Present and Past | by | T. G. Bonney | . . | . . | . . | . . | London | . . | . . | 1896 [contains descriptions of modern glaciers and their work, etc., and also an account of the drift deposits of Britain; considers they are of marine origin]. See Review in Geol. Mag., 1896, pp. 228-231.

C. Bradshaw. York S.W.

Ripple-marked Sandstone at Grimesthorpe, Sheffield [in the Middle Coal Measures, in the grounds of the Grimesthorpe Chemical Works]. Naturalist, Oct. 1896, pp. 319-320, with full-page illustration from a photograph.

Harwood Brierley. York S.E.

The Yorkshire Gypsey-Springs [describing intermittent springs at Wold Newton]. Nature, 1896, Vol. 53, p. 177.

Harwood Brierley. York S.E.

A Yorkshire Aerolite [a brief notice of the fall of an aerolite at Wold Newton in 1795]. Nature, 1896, Vol. 53, p. 230.

Horace T. Brown. Nottinghamshire, Lancashire, etc.

On a Recent Boring in the Trias at Stratford-on-Avon [refers briefly to beds of Keuper in Nottinghamshire, Lancashire, etc.]. Geol. Mag., Jan. 1896, Dec. 4, Vol. 3, pp. 54-58.

B. A. Burrell. York Mid W.

Analyses of the Water from the Dropping Well at Knaresborough, in Yorkshire. Journ. Chem. Soc., Vol. 69, 1896, pp. 536 et seq. **[not seen].**

F. M. Burton. Linc. N.

Lincolnshire Naturalists at Market Rasen [geological notes on the district visited]. Naturalist, Jan. 1896, pp. 11-12.

F. M. Burton. Linc. N.

The Story of the Lincoln Gap [the Presidential address to the Lincolnshire Naturalists' Union at Lincoln, 1895; illustrated by a diagram showing the present and former courses of the Trent, Witham, etc.]. Lincolnshire Notes and Queries, Oct. 1896 and Jan. 1897, 15 pp.; reprinted from Naturalist, 1895, pp. 273-280.

George J. Bush.

Manual of Determinative Mineralogy; revised and enlarged by Samuel L. Penfield. 164 pp. London: Chapman & Hall, 1896. (Reviewed in Mineral. Mag., May 1897, pp. 219-220, by A. H[arker]) **[not seen].**

J. W. Carr. See 'G. Elmsley Coke.'

W. Lower Carter. York N.W. and Mid W.

Yorkshire Naturalists at Hackfall and Tanfield [Geological notes]. Naturalist, June 1896, p. 196.

William Cash. York S.W., Lanc. S.

In Memoriam. William Crawford Williamson, LL.D., F.R.S. [refers at length to Williamson's work on the Geology of Yorkshire, Lancashire, etc.]. Naturalist, Jan. 1896, pp. 25-33.

G. E. Coke. Notts.

Southern Limit of the Nottinghamshire Coalfield [Map, Nottingham District; 1 inch = 3 miles]. Trans. Fed. Inst. Mining Engineers, Vol. 11, 1896, p. 339, and Coll. Guard., Vol. 71, 1896, p. 1111.

G. E. Coke. York S.W.

Boring below the Blackshale Coal-seam at Apperknowle, near Sheffield. Trans. Fed. Inst. Mining Engineers, Vol. 10, 1896, pp. 430 et seq.

G. Elmsley Coke, J. W. Carr, and W. W. Watts. Notts.

Excursion [of the Geologists' Association] to Nottingham and Leicester [Sections exposed during the construction of the new M.S. & L. Line to London were examined, including Keuper Marls, Rhætic and Lias, and the granitite of Brazil Wood, etc.]. Proc. Geol. Assn., Vol. 14, Part 10, 1896, pp. 430-433.

H. Conwertz. York S.E.

On English Amber, and Amber generally [Address delivered at the Ipswich meeting of the British Association; the variety of amber usually found on the east coast of England between Yorkshire and Essex is known by the name of *succinite*]. Natural Science, 1896, Vol. 9, pp. 99-106, and 161-167.

J. H. Cooke. Linc. N.

Lincolnshire Naturalists at Great Cotes [Geological notes]. Nat., Dec. 1896, pp. 371-372.

John H. Cooke. York N.E.

A Section in the Lower Oolites of Scarborough [in the well-known quarry owned by Messrs. Peacock, on Spring Hill, Falsgrave; details of section and list of fossils given]. Naturalist, Oct. 1896, pp. 289-292.

John H. Cooke. Linc. S.

Lincolnshire Naturalists at Bourne [Geological notes]. Naturalist, Oct. 1896, pp. 293-294.

John H. Cooke. Linc. N. and S.

Work for Lincolnshire Geologists [points out various directions in which Lincolnshire geologists should devote their energies]. Naturalist, July 1896, pp. 205-210.

JOHN CORDEAUX. LINC. N. AND S.

Lincolnshire Natural History [Presidential address to Linc. Nat. Union, delivered at Lincoln, 24th May 1894; geology referred to]. Linc. Notes and Queries, Jan. 1896, pp. 15-16, and remainder in April 1896.

G. C. CRICK. NORTH OF ENGLAND.

On *Goniatites evolutus*, Phillips, and *Nautilus tetragonus*, Phillips, with a list of the species belonging to the genus *Subclymenia* [describing numerous Palæozoic cephalopods from Yorkshire, Northumberland, Derbyshire, Isle of Man, etc.]. Geol. Mag., 1896, pp. 413-419.

J. J. DAVIES. LINC. S.

Lincolnshire Naturalists at Bourne [Geological notes]. Naturalist, Oct. 1896, pp. 294-296.

W. BOYD DAWKINS. ISLE OF MAN.

On the Geology of the Isle of Man [dealing with (a) the Ordovician Massif, (b) the Carboniferous Limestone of the South, (c) the Permian Strata of the North of the Island, (d) the Strata underneath Drift-covered Northern Plain, (e) general conclusions as to solid geology, (f) the Boulder-drift of the north, and (g) the Pre-historic strata]. Rep. Brit. Assn. (Liverpool Meeting), 1896, pp. 776-779.

CHARLES E. DERANCE. LANC. S.

The Depth to Productive Coal-Measures between the Warwickshire and Lancashire Coalfields. Trans. Fed. Inst. Mining Engineers, Vol. 10, 1896, pp. 244 et seq.

CHARLES E. DERANCE. ? CHESHIRE.

Notes on the Geological Features of the Coast of North Wales from Liverpool to Menai Bridge. Trans. Fed. Inst. Mining Engineers, Vol. 11, 1896, pp. 552 et seq.; and Coll. Guard., Vol. 72, 1896, pp. 178 et seq. **[not seen].**

C. E. DERANCE. CHESHIRE.

Excursions. — I.—Anderton, Great Budworth Church, and the Marston Salt Mine [geological observations reported]. Ann. Rep. and Trans. North Staffs. N. F. Club for 1895-96, Vol. 30, pp. 128-9.

R. M. DEELEY. DERBYSHIRE.

Discovery of Mammalian Remains in the Old River Gravels of the Derwent, near Derby, Part 2 [describing in detail the deposits in which the mammalian remains, described by Arnold-Bemrose, were found; and also gives an account of the geology of the surrounding country; 'the gravels (containing the remains) are of later date than the Great Chalky Boulder Clay, and were formed at a time when the rivers were removing from their pre-glacial valleys the older boulder clays, with which they had been partially filled']. Quart. Journ. Geol. Soc., Vol. 52, 1896, pp. 501-510 (plan and sections); abstracts in Geol. Mag., 1896, p. 283; and Ann. and Mag. of Nat. Hist., June 1896, p. 468.

See also 'H. H. Arnold-Bemrose.'

JOSEPH DICKENSON.

River Valleys [not seen]. Trans. Manch. Geol. Soc., Vol. 24, 1896, pp. 137 et seq.

E. DICKSON. See 'P. Holland.'

JANE DONALD. CUMBERLAND.

Notes on Some Carboniferous Gasteropoda from Penton and elsewhere **[not seen].** Trans. Cumb. Assn., Vol. 9, 1895, pp. 127 et seq.

G. DUNSTON. NOTTS.

The Eastern Extension of the Midland Coalfield, and Exploration at Southcar. Proc. Midl. Inst. Min. Engin., Vol. 14, pp. 245-252, 1896.

H. St. John Durnford. York S.W.

Notes on the Sinking of the No. 1 Pit at the Acton Hall Colliery [Featherstone], with Special Reference to the Thinning Out of the Silkstone and Beeston Coal-seams. Trans. Fed. Inst. Mining Engineers, Vol. 10, 1896, pp. 444 et seq. **[not seen]**.

L. Fletcher.

An Introduction to the Study of Rocks [not seen]. Reviewed by W. W. W[atts]. in Mineral. Mag., Oct. 1896, pp. 148-9.

Henry O. Forbes. Cheshire.

The Submerged Forests of the Wirral in Cheshire. Knowledge, Vol. 19, 1896, pp. 145 et seq.

C. Le Neve Foster. Isle of Man, etc.

Reports of H.M. Inspector of Mines for the North Wales, &c., and the Isle of Man District (No. 9) to Her Majesty's Secretary of State . . . . for the year 1895. London, 1896 **[not seen].**

C. Le Neve Foster. Northern Counties.

Second Annual General Report upon the Mining Industry of the United Kingdom of Great Britain and Ireland. For the year 1895. London, 1896 **[not seen].**

Robert L. Galloway. Northern Counties.

Annals of Coal Mining and the Coal Trade. Coll. Guard., Vol. 71, 1896, pp. 967 et seq., 1013 et seq., 1059 et seq., 1105 et seq., 1115 et seq., 1201 et seq. [with map of the Tyne District], and Vol. 72, 1896, pp. 15 et seq., 61 et seq., 111 et seq., 157 et seq., 207 et seq., 303 et seq., 349 et seq., 394 et seq., 440 et seq., 502 et seq., 535 et seq., 581 et seq., 642 et seq., 723 et seq., 772 et seq., 819 et seq., 867 et seq., 918 et seq., 961 et seq., 1009 et seq., 1059 et seq., 1107 et seq., and 1153 et seq. **[not seen].**

E. J. Garwood. Northern Counties.

Life-zones in the British Carboniferous Rocks.—Report of the Committee consisting of [three names; preliminary report only; suggesting appointment of geologists in different districts]. Rep. Brit. Assn., 1896 (Liverpool Meeting), pp. 415-416; abstract in Geol. Mag., 1896, pp. 519-520.

Archibald Geikie. Isle of Man.

Annual Report of the Geological Survey . . . for . . . 1895 [with additions to the geology of the Isle of Man, especially as regards the structure of the Skiddaw Slate area, with its cleavage and crush-breccias, the Dhoon granite and associated dykes, the drift deposits and striated rock-surfaces, and the high-level gravels, whose glacial age is now established by the contents of certain peaty layers]. 48 pp. Appendix to 43rd Rep. Departm. Sci. and Art, 1896.

Archibald Geikie. York N.E., Cumberland.

The Latest Volcanoes of the British Isles [Presidential address delivered to the Glasgow Geological Society; the dyke running in a straight line from Cumberland to Robin Hood's Bay briefly referred to (p. 182)]. Trans. Geol. Soc., Glasgow, Vol. 10, Part 2, for 1894-5, 1895-6, publ. 1896, pp. 179-197.

Archibald Geikie. Isle of Man.

On some Crush-Conglomerates in Anglesey [compared with the Manx crush-conglomerate described by G. W. Lamplugh]. Rep. Brit. Assn. (Liverpool Meeting), 1896, pp. 806-807, and Geol. Mag., 1896, pp. 481-2.

Geological Survey of England and Wales.

General Geological Map of England and Wales [4 miles to an inch). Hand-painted edition, sheets 1 (Title), 2 (Northumberland), 4 (I. of Man),

5 (Lake District, Lancashire, and Yorkshire), and 8 (Cheshire, Derbyshire, Nottinghamshire); chromo-lithographed edition, sheets 6 (Yorkshire coast) and 9 (Lincolnshire).

J. G. GOODCHILD. LAKE DISTRICT.

Glacial Furrows [on a large scale; noted near Appleby-on-the-Eden]. Glac. Mag., Vol. 4, Part 1, June 1896, pp. 1-7.

R. W. GOULDING. LINC. S.

Lincolnshire Naturalists at Grantham [Geological notes]. Nat., Sep. 1896, pp. 273-276.

J. W. GREGORY. YORK N.E.

A Revision of the British Jurassic Bryozoa.—Part III. The Genus *Berenicea* [including note of *B. scobinula* (Mich.), Cornbrash, Yorkshire]. Ann. and Mag. N. H., Jan. 1896, p. 47.

J. W. GREGORY. NORTH OF ENGLAND.

Catalogue of the Jurassic Bryozoa in the British Museum [Natural History]. 8vo., pp. 240, 11 plates. London, 1896. Reviewed in Geol. Mag., 1896, pp. 378-9.

FRED F. GRENSTED. YORK N.W. AND MID W.

A Contribution to the Dynamical Theory of the Craven Highlands [shows that the ancient earth movements can be geometrically referred to a common centre, viz., Bainbridge; and considers no theory so good to account for these phenomena as that propounded in Mellard Reade's 'Origin of Mountain Ranges']. Proc. Liverpool Geol. Soc., Vol. 7, Part 4, 1895-6, pp. 377-383.

W. S. GRESLEY. LINCS., YORK S.W., NOTTS.

The Yorkshire and Nottinghamshire Coalfield: Geological Suggestions relative to its east-ward Extension beneath the Permian and Secondary Strata into Lincolnshire [inferring an anticline in the Carboniferous rocks beneath the known anticline in the Secondary Strata near the South end of the Lincolnshire Wolds]. Trans. Fed. Inst. Min. Engin., Vol. 11, 1896, pp. 143-153.

ALFRED HARKER. LAKE DISTRICT.

On Certain Granophyres, modified by the Incorporation of Gabbro-Fragments, in Strath (Skye) [brief allusion to the Granophyre of Carrock Fell]. Quart. Journ. Geol. Soc., Vol. 52, May 1896, pp. 320-330.

A. HARKER. LAKE DISTRICT.

The English Lake District [abstract of lecture delivered to the Hull Geological Society; the various rocks of the Lake District described and a review given of their geological history]. Trans. Hull Geol. Soc., Vol. 2, 1894-5, publ. 1896, pp. 18-19.

ALFRED HARKER. ? NORTHERN COUNTIES.

The Classification of Igneous Rocks. Science Progress, Vol. 4, 1896, pp. 469 et seq.

ALFRED HARKER. ? NORTHERN COUNTIES.

The Natural History of Igneous Rocks: I. Their Geographical and Chronological Distribution. Science Progress, n.s., Vol. 1, 1896, pp. 12 et seq.

W. N. HARTLEY AND HUGH RAMAGE. YORK N.E.

On the Occurrence of the Element Gallium in the Clay-Ironstone of the Cleveland District of Yorkshire. Proc. Roy. Soc., Vol. 60, 1896, pp. 19 et seq.

W. A. HERDMAN. ISLE OF MAN, ETC.

The Marine Zoology, Botany, and Geology of the Irish Sea.— Fourth and Final Report of the Committee, consisting of [10 names; geology briefly referred to]. Rep. Brit. Assn. (Liverpool Meeting), 1896, pp. 417-450.

THOMAS HICK. LANC. S.

On a Sporangiferous Spike from the Middle Coal Measures, near Rochdale. Mem. Manch. Lit. and Phil. Soc., Ser. 4, Vol. 10, 1896, pp. 73 et seq.

THOMAS HICK. YORK S.W.

On *Rachiopteris cylindrica*, Will. [from the Lower Coal Measures of Halifax; detailed account of structure]. Mem. and Proc. Manch. Lit. and Phil. Soc., Vol. 41, pp. 1-14, and plate 1; reprinted as No. 2 of Notes from Manch. Museum, and dated 17th Nov. 1896.

E. HILL. YORK S.E.

Heights of Chalk [letter thanking G. W. Lamplugh for information as to the height of the Yorkshire Chalk]. Geol. Mag., 1896, p. 142.

NORTHUMBERLAND, YORK N.W.

WHEELTON HIND. CHESHIRE, DERBYSHIRE.

A Monograph of the British Carboniferous *Lamellibranchiata*. Part 1, pp. 1-80, plate 1, 2 [Introduction discussing classification of the carboniferous strata, etc.; descriptions of species including *Modiola transversa* (sp. nov.) from Congleton Edge, and other species from Redesdale and Lowick, Wensleydale, Castleton, etc.]. Palæontograph. Soc., Vol. 50, 1896.

WHEELTON HIND. NORTHERN COUNTIES.

A Monograph on Carbonicola, Anthracomya, and Naiadites. Pal. Soc. Monog., 1896, Part 3, pp. 171-182, plate 21.

WHEELTON HIND. NORTHUMB., YORKSHIRE, DERBYSHIRE, ETC.

On Zonal Divisions of the Carboniferous System [discussing the value of specific fossils as indications of definite horizons in the carboniferous system]. Geol. Mag., 1896, pp. 255-261.

GEORGE JENNINGS HINDE. YORK N.W., LANC. W.

Descriptions of New Fossils from the Carboniferous Limestone. I. On *Pemmatites constipatus*, sp. nov., a Lithistid Sponge. II. On *Palæacis humilis*, sp. nov., a new Perforate Coral, with remarks on the genus. III. On the Jaw-apparatus of an annelid, *Eunicites Reidiæ*, sp. nov. [Describes and figures *Pemmatites constipatus*, sp. nov., from the Yoredale beds of Yorkshire, found by Mr. J. Rhodes; and *Palæacis humilis*, from the Carboniferous Limestone and Shale Series, on the banks of the Hodder, near Stonyhurst, found by the Rev. G. C. H. Pollen]. Quart. Journ. Geol. Soc., Vol. 52, Aug. 1896, pp. 438-451 (plates 22 and 23); abstracts in Geol. Mag., 1896, p. 281; and Ann. and Mag. Nat. Hist., June 1896, p. 467.

P. HOLLAND AND E. DICKSON. LANC. S., CHESHIRE.

Notes on Analyses of Permian and Triassic Rocks from the Neighbourhood of Liverpool [with table showing the constituents of the different samples examined, and plate showing the shapes of the flakes and splinters of silica which forms the cement in all the sandstones]. Proc. Liverpool Geol. Soc., Vol. 7, Part 4, 1895-6, pp. 443-452.

T. V. HOLMES. CUMBERLAND.

Notes on the Whitehaven Sandstone [discussing the evidence respecting the position among the Coal-measures of the Whitehaven Sandstone, and criticising the views of J. D. Kendall]. Geol. Mag., 1896, pp. 405-413.

W. F. HOLROYD AND J. BARNES. LANC. S., YORK S.W.

On the Rocks and Fossils of the Yoredale Series of the Marsden and Saddleworth Valleys [describing and figuring numerous sections in the Yoredale series, Millstone Grit, etc., several of which are traversed by faults; discussion by various gentlemen also printed]. Trans. Manch. Geol. Soc., Vol. 24, Part 5, 1896, pp. 70-99.

W. F. Holroyd and J. Barnes. York Mid W.

On the Stratified Clay of Strathern, and on the Imatra or "Fairy Stones" found therein [Stalagmitic and stalactitic deposits from the Permian rocks near Ripon also exhibited and briefly described]. Trans. Manch. Geol. Soc., Vol. 24, Part 7, 1896, pp. 110-112.

W. F. Holroyd. See 'J. Barnes.'

Henry H. Howorth. York S.E., Linc. N.

The Dislocation and Disintegration of the Chalk in Eastern England and in Denmark [considering that the beds probably from the Oolites upwards were affected by a great movement in which they were moulded into wolds and valleys; the movement led to considerable dislocation and disintegration, and subsequent denudation]. Geol. Mag., 1896, pp. 298-309.

Henry H. Howorth. Eastern Counties.

Ice-Sheets and Scandinavian Boulders [discussing at some length the various foreign boulders which occur in East Anglian glacial beds, and their bearing on the Scandinavian Ice-Sheet theory; convinced by arguments and facts brought forward by T. Sheppard that his former contention that the Scandinavian boulders were brought to England by human agency is wrong]. Glac. Mag., Vol. 4, Part 3, Dec. 1896, pp. 95-110.

Henry H. Howorth. York S.E., etc.

The so-called Middle Sands and Glacial Gravels of Eastern England [thinks 'there is every ground for believing the process (of distributing the drift beds) to have been rapid, and, if not sudden, to have been continuous and not intermittent']. Geol. Mag., 1896, pp. 533-541.

Henry H. Howorth. York S.E., Linc. N.

The Chalky and Other Post-Tertiary Clays of Eastern England [considers (p. 463) that 'these clays present no single feature consistent with their having been deposited by ice']. Geol. Mag., 1896, pp. 449-463.

H. H. Howorth. York S.E., Linc. N., etc.

The Destruction and Shattering of the Chalk of Eastern England [enlarging on the observations made by Prof. G. A. J. Cole and Rev. E. Hill; thinks the masses of Chalk found in the drift in the Eastern Counties 'are not far-transported boulders at all, but . . the remains . . of the once continuous strata which occupied the areas']. Geol. Mag., Dec. 4, Vol. 3, Feb. 1896, pp. 58-66; abstract in Glac. Mag., Vol. 4, No. 1, June 1896, p. 43.

Wilfrid H. Hudleston. Linc. N. and S., York N.E.

A Monograph of the Inferior Oolite Gasteropoda: Part 9, pp. 445-514, Pl. xli.-xliv. [describing and figuring many species from the Lincolnshire Limestone, the Dogger, and the Scarborough Limestone; the new species include *Trochotoma lindonenis* from Lincoln, *Emarginula lindonensis* from Stoke Lodge, *Cylindrites brevispira* from Weldon, *Brachytrema pontonis* from Ponton, and *Nerinæa neglecta* from Weldon]. Palæontograph. Soc., Vol. 50, 1896.

W. H. Hutchinson. North of England.

Prehistoric Man and Beast (illustrated), 8vo., pp. xxiii. + 298. London, Smith, Elder & Co., 1896 [refers to the Cave Deposits of the North of England, the Chalky Boulder Clay, etc.]. See review in Geol. Mag., Feb. 1897, pp. 77-80.

W. and A. K. Johnston [Publishers]. Northern Counties.

Geological Map of the British Isles. W. & A. K. Johnston, Edinburgh and London, 1896 [Scale of 14 miles to an inch].

NORTHUMBERLAND, WESTMORLAND,
T. RUPERT JONES AND JAMES W. KIRKBY. CUMBERLAND.

On Carboniferous Ostracoda from Ireland [with incidental references to occurrence of *Cytherella valida* J.&K., which is good and common in Northumberland and Westmorland, as well as at Calees, East Cumberland; *C. extuberata* J.&K., in some localities in Northumberland; *Leperditia suborbiculata* (Munster), in North of England; *L. scotoburdigalensis* (Hibbert), in North of England; *L. subrecta* (Portl.), known from the Lower Mountain Limestone of Northumberland, occurring with the last-named in a dark shale at Tweedmouth; *Lep.* aff. *wrightiana* J.&K., from the Carboniferous limestone of Clitheroe, Lancashire, but with the surface covered with large and deep pits; *L. acuta* J.&K., in the Lower Carboniferous strata of Northumberland and Westmorland; *L. compressa* J.&K., in Lower Carboniferous rocks in Durham; *Beyrichia craterigera,* in Lower Carboniferous rocks of Northumberland, Westmorland, and Lancashire; *B. gigantea* J.&K., in Derbyshire; *Kirkbya permiana* Jones, in Carboniferous limestone shales in North of England and in Permian rocks of Durham and Yorkshire; *K. spiralis* J.&K., in Lower Carboniferous rocks of Northumberland and Cumberland; *K. costata* (M'Coy), very abundant in some Northumberland localities, notably at Plashetts, in Lower Carboniferous strata, also occurring in Westmorland and Cumberland; *Beyrichiopsis fimbriata* J.&K., in Lower Carboniferous of Northumberland; *Bythocypris phillipsiana* (J.&Holl.) var. *carbonica* J.&K., in Carboniferous rocks of Westmorland and Northumberland; *Argillœcia æqualis* J.&K., in Lower Carboniferous strata of Northumberland, Westmorland, and Yorkshire; and *Macrocypris jonesiana* Kirkby, in Lower Carboniferous of North of England and Permian of Durham]. Sci. Trans. R. Dubl. Soc., Series 2, Vol. 6, No. 7, publ. Dec. 1896, pp. 173-200, and plates 11-12.

THOMAS KAY. LANC. S.

On an Earthen Vase found in the Boulder Clay at Stockport. Mem. Manch. Lit. and Phil. Soc., Series 4, Vol. 10, 1896, pp. 87 et seq.

PERCY F. KENDALL. DURHAM.

Note on a Striated Surface of Magnesian Limestone near Sunderland [near Roker; indicating a movement of the ice from the east]. Glac. Mag., Vol. 4, Part 2, Sept. 1896, pp. 60-61.

PERCY F. KENDALL. YORKSHIRE.

On some Post-Pliocene Changes of Physical Geography in Yorkshire [refers to the pre-glacial valleys, and former courses of the Derwent, Nidd, Wharfe, etc.]. Rep. Brit. Assn. (Liverpool Meeting), 1896, pp. 801-802; also Glac. Mag., Vol. 4, Part 2, Sept. 1896, pp. 82-84.

P. F. KENDALL [Secretary]. NORTHERN COUNTIES.

Erratic Blocks of the British Isles.—First Report of the Committee, consisting of [nine names; principally consists of records in the northern counties]. Rep. Brit. Assn. (Liverpool Meeting), 1896, pp. 366-377.

PERCY F. KENDALL. YORK N.E., S.E., AND MID W.

Notes on the Superficial Geology of the Vale of York [abstract of a paper which appeared in the Proceedings of the Yorkshire Geological and Polyt. Soc. for 1895]. Glac. Mag., Vol. 4, Part 2, Sep. 1896, p. 94.

PERCY F. KENDALL AND J. LOMAS. ISLE OF MAN, ETC.

Contributions to the Glacial Geology of North Wales. No. 1. On a Terminal Moraine at Pwll-glas near Ruthin [briefly refers to the Isle of Man, etc.]. Glac. Mag., Vol. 3, Part 4, March 1896, pp. 170-184.

P. F. KENDALL. See 'J. LOMAS.'

P. M. C. KERMODE. ISLE OF MAN.

The Isle of Man. Introduction, History, and Antiquities [prehistorics briefly referred to]. Handbook to Liverpool (Brit. Assn. Meeting, 1896), pp. 145-164.

ROBERT KIDSTON. YORK S.W. AND MID W.

On the Fossil Flora of the Yorkshire Coalfield. Trans. Roy. Soc. Edinb., Vol. 38, 1896, pp. 203 et seq.

G. H. KINAHAN. ISLE OF MAN, ETC.

On Possible Land Connections, in Recent Geological Times, between Ireland and Great Britain [geological features of the Isle of Man, etc., briefly referred to]. Trans. Manch. Geol. Soc., Vol. 24, Part 7, 1896, pp. 113-130.

W. KIRKBY. See 'T. Rupert Jones.'

PHILIP LAKE. LAKE DISTRICT.

The British Silurian Species of Acidaspis [describing and figuring *Acidaspis hughesi* Salter MS., from Casterton Low Fell, and Gale Garth, Casterton]. Quart. Journ. Geol. Soc., Vol. 52, May 1896, pp. 235-245 and plates 7 and 8.

G. W. LAMPLUGH. ISLE OF MAN.

An outline of the Geology of the Isle of Man. With Geological Map [dealt with under the heads of Bibliography, the Older Palæozoic Series, Pre-Carboniferous Igneous Rocks, the Carboniferous System, the Concealed Strata of the Northern Plain, the Basaltic (Tertiary ?) Dykes, the Glacial Deposits, and Post-Glacial and Recent]. (Coloured geological map). Handbook to Liverpool (Brit. Assn. Meeting, 1896), pp. 165-181.

G. W. LAMPLUGH. YORK N.E. AND S.E., LINC. N.

On the Speeton Series in Yorkshire and Lincolnshire [giving results of further work at Speeton, and correlating the Yorkshire beds with those of Lincolnshire; in Mid-Lincolnshire all the palæontological zones of Speeton are identified and traced in spite of the greatly modified lithological aspect of the deposits]. Quart. Journ. Geol. Soc., Vol. 52, May 1896, pp. 179-220; Abstract in Geol. Mag., 1896, pp. 87-88.

G. W. LAMPLUGH. YORK S.E.

The Formation of Chalk Boulders [a letter referring to papers by Prof. G. A. J. Cole and Rev. E. Hill in a previous number; thinks the landslips of chalk at Antrim, referred to by Prof. Cole, 'insufficient even to account for the masses of chalk at Cromer,' and continues 'it is quite certain the explanation will not apply' to the masses of Lias in the Basement Clay in Filey Bay and Bridlington Bay; nor to the patch of Speeton Clay which has surmounted the chalk of Flamborough Head]. Geol. Mag., 1896, Dec. iv., Vol. iii., pp. 45-6; Abstract in Glac. Mag., Vol. 4, Part 1, June 1896, pp. 42-43.

JOSEPH LOMAS. LANC. S., CHESHIRE.

Observations on Glacial Striæ [describing the various forms of striæ on the rock faces under the Gorner Glacier, and adds 'among the striations in the neighbourhood of Liverpool it is possible to match every feature]. Proc. Liverpool Geol. Soc., 1895-6, Vol. 7, Part 4, pp. 383-387, and plate; Abstract in Glac. Mag., Vol. 4, Part 2, Sept. 1896, p. 90.

J. LOMAS AND P. F. KENDALL. LANC. S., CHESHIRE.

The Glacial Phenomena of the Vale of Clwyd [referring to the glacial beds of Lancashire and Cheshire]. Rep. Brit. Assn. (Liverpool Meeting), 1896, p. 801.

J. LOMAS. See 'Percy F. Kendall.'

H. E. MADDOCK. YORK S.E. AND LINCS. N.

Fossil Zones of the Lower Chalk of the South Coast [abstract of a lecture delivered to the Hull Geological Society; the fossil zones of the

Naturalist,

south coast are compared with those of Yorkshire; illustrated by 'sections from bottom of Lower Chalk to Lowest Flint Band of Middle Chalk at Eastbourne and Speeton]. Trans. Hull Geol. Soc., Vol. 2, 1894-5, publ. 1896, pp. 20-23.

J. E. MARR. LAKE DISTRICT.

The Waterways of English Lakeland [tracing the initiation and development of the drainage system of the Lake District and the changes produced in it by the glaciation of the country]. Geogr. Journ., Vol. 7, 1896, pp. 602-625, with map; abstract in Glac. Mag., Vol. 4, No. 1, June 1896, pp. 40-41.

J. E. MARR. LAKE DISTRICT.

On the Lake Basins of Lakeland [examining the glacier-erosion theory in the light of Dr. Mill's 'Bathymetric Survey of the English Lakes,' and criticising that hypothesis]. Proc. Geol. Assn., Vol. 14, 1896, pp. 273-286.

J. E. MARR. LAKE DISTRICT.

Additional Notes on the Tarns of Lakeland [supplement to paper in Q. J. G. S. for Feb. 1895, p. 35; describing Watendlath Tarn; Hard Tarn, Helvellyn; Hayeswater; and Angle Tarn, Patterdale; all the tarns examined are held in by a barrier of drift]. Quart. Journ. Geol. Soc., Vol. 52, Feb. 1896, pp. 12-16, plan and sections; abstract in Geol. Mag., Jan. 1896, p. 40.

ISLE OF MAN AND NORTH OF ENGLAND.

J. E. MARR (Drawn up by) [Should be 'E. J. Garwood'].

Report of Committee . . . . appointed to Study the Life-zones in the British Carboniferous Rocks [preliminary report, suggesting appointment of geologists to different districts in England]. Geol. Mag., 1896, pp. 519-520.

J. E. MARR. NORTHERN COUNTIES.

Presidential Address delivered to Section C. [refers to various points in connection with the geology of the Northern Counties]. Rep. Brit. Assn. (Liverpool Meeting), 1896, pp. 762-775; also in Geol. Mag., 1896, pp. 464-479; and Nature, Vol. 54, 1896, pp. 494 et seq.

J. E. MARR.

The Graptolites [not seen]. Sci. Progress, Vol. 5, 1896, pp. 360 et seq.

E. A. MARTEL. YORK N.W.

Sur le Gouffre de Gaping-Ghyll (Angleterre) [more complete exploration made possible by the diversion of Fell Beck]. Comptes Rendus, Vol. 122, 1896, pp. 51-53.

EDWARD A. MARTIN. NORTHERN COUNTIES.

The Story of | a Piece of Coal | what it is, whence it comes, and whither it goes | by | Edward A. Martin, F.G.S. | . . | . . | London: . . | 1896 [Photograph of the well-known Clayton fossil *Stigmaria* as frontispiece].

ARTHUR J. MASLIN. YORKSHIRE.

The Rise of Palæontology [briefly refers to Yorkshire Geology and Geologists]. Sci. Goss., Nov. 1896, pp. 142-144, and Dec. 1896, pp. 182-184.

A. T. METCALFE. NOTTS., DERBY.

The Gypsum Deposits of Nottinghamshire and Derbyshire [occurring as thick nodular beds, large spheroidal masses, and lenticular intercalations in the Upper Marls of the Keuper]. Trans. Fed. Inst. Min. Engin., Vol. 12, pp. 107-114; abstracts in Quart. Journ. Geol. Soc., Vol. 52, Aug. 1896, p. 461; and Geol. Mag., Feb. 1896, p. 87.

1900 June 1,

G. H. Morton. Cheshire.

Glacial Striæ at Liscard, near Liverpool [letter to the Editor recording another striated surface at the end of Rake Lane, Liscard, on the Cheshire side of the Mersey, the average direction of the striæ being 12° W. of N.]. Glac. Mag., Vol. 4, No. 1, June 1896, p. 46.

G. H. Morton. Lanc. S., Cheshire.

The Geology of the Country around Liverpool [describing the strata from the Carboniferous Limestone to the Drift, which occur within a radius of 20 miles from Liverpool]. Handbook to Liverpool and the Neighbourhood, Brit. Assn. Meeting, 1896, pp. 16-35, with map.

G. H. Morton. Lanc. S., Cheshire.

Recent Borings in the Red Marl near Liverpool [describing borings at Altcar and Ford near Bidston Hill, and giving details of Rocks passed through]. Rep. Brit. Assn. (Liverpool Meeting), 1896, pp. 780-781; Geol. Mag., 1896, pp. 496-498; and Coll. Guard., Vol. 72, 1896, pp. 823 et seq.

G. H. Morton. Cheshire.

Erosion of the Sea-coast of Wirral [pointing out the enormous rate at which the land is being denuded on the coast of the Wirral, viz., between four and five yards per annum, from 1863 to 1894, altogether 144 yards during that period]. Rep. Brit. Assn. (Liverpool Meeting), 1896, pp. 781-782; and Geol. Mag., 1896, pp. 516-7.

Herbert Muff and Thomas Sheppard. York N.E.

Notes on the Glacial Geology of Robin Hood's Bay, Yorkshire [giving a general account of the drift beds of the Bay; and recording a new striated rock surface, the second discovered on the Yorkshire Coast, the direction of the striæ being from N. 20° E. mag.]. Glacialist's Mag., Vol. 4, Part 2, Sept. 1896, pp. 47-60.

E. T. Newton. See 'G. Sharman.'

G. O[ldfield]. York N.E.

Boring at Rillington [Note reads as follows:—'This was made at Rillington Field and passed through 42 feet of sand with 3 feet of water']. N. and E. Yorks. Science Notes, Jan. 1896, p. 72.

Cyril E. Parsons. Derbyshire.

The Deposit at the Mill Close Lead-Mine, Darley Dale, Matlock. Trans. Fed. Inst. Min. Engin., Vol. 12, 1896, pp. 115-121.

Alexis P. Pavlow. York S.E., Lincs. N. and S.

On the Classification of the Strata between the Kimeridgian and the Aptian [comparing the Speeton Clay of Yorkshire, and Claxby Ironstone and Spilsby Sandstone, etc., of Lincolnshire, with the lower Cretaceous rocks of Germany and Russia]. Quart. Journ. Geol. Soc., Vol. 52, Aug. 1896, pp. 542-555, and plate.

A. H. P[awson]. Lanc. S., York S.W.

Prof. Williamson's Autobiography [Reviewed; geological work referred to]. Naturalist, Oct. 1896, pp. 299-301.

S. L. Petty. Furness.

The Wild Boar in Furness [a bronze celt, and 'the upper tusks of two boars' found 12 or 13 inches below the surface whilst excavating at Mossfield, Roose, near Barrow]. Naturalist, Dec. 1896, p. 354.

Henry Preston. Linc. S.

Some Account of the Surface Geology of the District North of Grantham [deals briefly with the Liassic and Oolitic rocks of the neighbourhood]. Naturalist, Sept. 1896, pp. 285-288.

Hugh Ramage. See 'W. N. Hartley.'

Rance. See under 'C. E. DeRance.'

T. Mellard Reade. Lake District.

Notes on the Drift of the Mid-Wales Coast [noting that the Lake District erratics, which occur so plentifully from Macclesfield to Moel Tryfaen, have no place in the drift described; after looking carefully for Eskdale granite and other typical rocks, cannot find a single example]. Proc. Liverpool Geol. Soc., Vol. 7, Part 4, 1895-6, pp. 410-419; abstract in Glac. Mag., Vol. 4, Part 2, Sept. 1896, p. 91.

T. Mellard Reade. North of England.

British Geology in relation to Earth-folding and Faulting [Presidential address to the Liverpool Geological Society, delivered 8th October 1895; refers to the Pennine area, etc.]. Proc. Liverpool Geol. Soc., 1895-6, Vol. 7, Part 4, pp. 363-377.

T. Mellard Reade. Lanc. S.

Foraminiferal Boulder Clay at Great Crosby and at Blackpool [gives lists of foraminifera compiled by Mr. Joseph Wright, of Belfast, from specimens of Boulder Clay from Great Crosby and Blackpool; from the former place no less than 1,080 foraminifera (900 specimens being of *Nonionina depressula*) were collected from a piece of clay weighing 2 lbs. 10 ozs.; some of these have not previously been recorded in Britain]. Proc. Liverpool Geol. Soc., Vol. 7, Part 4, pp. 387-390; abstract in Glac. Mag., Vol. 4, Part 2, Sept. 1896, p. 91.

T. Mellard Reade. North of England.

The Present Aspects of Glacial Geology [invoking the marine origin of the drift beds near the sea border, which contain fragments of marine shells, and speaking of the 'exaggerated form in which land-ice theories are often presented to us']. Geol. Mag., 1896, pp. 542-551.

T. Mellard Reade. Lanc. S., Cheshire.

Oscillations in the Level of the Land as shown by the Buried River-Valleys and Later Deposits in the neighbourhood of Liverpool [describing the various glacial, peat, etc., beds in the neighbourhood of Liverpool; and referring to the oscillations of land-level which these indicate]. Rep. Brit. Assn. (Liverpool Meeting), 1896, pp. 782-783; Geol. Mag., 1896, pp. 488-492; and Glac. Mag., Vol. 4, Part 2, Sept. 1896, p. 86.

F. R. Cowper Reed. Westmorland.

The Fauna of the Keisley Limestone. Part I. [Describing the Trilobites, about 40 species (several of which are new), belonging to ten families]. Quart. Journ. Geol. Soc., Vol. 52, Aug. 1896, pp. 407-437, and plates 20 and 21; Abstract in Geol. Mag., 1896, p. 235; and Ann. and Mag. of Nat. Hist., June 1896, p. 467.

F. R. Cowper Reed. Westmorland.

Woodwardian Museum Notes. Notes on the Evolution of the Genus *Cheirurus* [refers to specimens of Trilobites from the Keisley Limestone, Stockdale Shales, etc.]. Geol. Mag., 1896, pp. 127-123 and 161-167.

J. F. Robinson. York S.E.

[Small boulder of Rhomb-porphyry at] Swine [Embedded 5 feet in the Boulder Clay]. Trans. Hull Geol. Soc., Vol. 2, 1894-5, publ. 1896, p. 8.

Lake District, York N.W., Cheviot,
H. Rosenbusch. Durham, Derbyshire.

Mikroskopische Physiographie der Massigen Gesteine, 3rd ed., enlarged and revised [with numerous descriptions of the micro-characters of north-country rocks]. 8vo., pp. xix. + 1360, with six plates; Stuttgart, 1896.

ARTHUR W. ROWE. YORK S.E.

The Preparation and Mounting of Chalk Fossils [stating that the treating of chalk fossils with dilute hydrochloric acid should be confined to the Flamborough Head sponges, etc.]. Natural Science, Nov. 1896, pp. 303-311.

H. G. SEELEY. YORK N.E.

On a Pyritous Concretion from the Lias of Whitby, which appears to show the External Form of the Body of Embryos of a Species of *Plesiosaurus*. Ann. Rep. Yorks. Phil. Soc. for 1895, publ. 1896, pp. 20 et seq.

G. SHARMAN AND E. T. NEWTON. YORK S.E.

Note on some Cretaceous Fossils from the Drift of Moreseat, Aberdeen [comparing the Moreseat fossils with specimens from the Speeton Clay of Yorkshire in G. W. Lamplugh's collection]. Geol. Mag., 1896, pp. 247-254.

THOMAS SHEPPARD. LINC. N., YORK S.E.

Notes on the Occurrence of Boulders of Shap Granite, etc., in Lincolnshire [records two examples at Barton; one in Boulder clay; the first for the county, and gives an account of the aspect of the neighbourhood in glacial times]. Naturalist, Nov. 1896, pp. 333-339.

THOMAS SHEPPARD. LINC. N. and S.

Lincolnshire Boulders [addition to previous note, and giving list of works referring to the erratics of the county]. Nat., Dec. 1896, p. 373.

THOMAS SHEPPARD. YORK S.E.

On Another Section in the so-called Interglacial Gravels of Holderness [abstract of paper which appeared in the Proceedings of the Yorkshire Geological and Polyt. Soc. for 1895]. Glac. Mag., Vol. 4, Part 2, Sept. 1896, pp. 93-94.

T. SHEPPARD. YORK S.E.

[Boulders at] Burstwick[; from the gravel pits and in the village: including several Lake District, Norwegian, and other rocks]. Trans. Hull Geol. Soc., Vol. 2, 1894-5, publ. 1896, p. 8.

THOMAS SHEPPARD. See 'Herbert Muff.'

WILLIAM SIMPSON. YORK MID W.

Some Physiographical and Geological Features of the Parish of Halifax. Halifax Naturalist, 1896, Vol. 1, pp. 2-6, 26-29.

WILLIAM SIMPSON. YORK MID W.

The Strata of the Parish of Halifax. Halifax Naturalist, 1896, Vol. 1, pp. 69-77.

J. W. STATHER. YORK S.E.

[Boulders at] Melton[; on the Humber Bank; including a great variety of Scandinavian rocks; also recording a rhomb-porphyry at Bessingby]. Trans. Hull Geol. Soc., Vol. 2, 1894-5, publ. 1896, p. 8.

J. W. STATHER [Secretary; not signed]. YORK S.E.

Boulders noted on the Holderness Coast between Withernsea and Hornsea, 1895 [tabulated report of 2,070 boulders, measuring over a foot in diameter, which have been recorded on the coast between Withernsea and Hornsea (14 miles) by the members of the East Riding Boulder Committee]. Trans. Hull Geol. Soc., Vol. 2, 1894-5, publ. 1896, pp. 6-7.

C. FOX STRANGWAYS. YORK MID W., N.E., AND S.E.

Glacial Phenomena near York [Abstract of a paper which appeared in the Proceedings of the Yorkshire Geological and Polyt. Soc. for 1895]. Glac. Mag., Vol. 4, Part 2, Sept. 1896, p. 94.

J. J. Thomas. Westmorland.

Westmorland Slates; their Geology, Chemistry, and Architectural Value. Journ. Roy. Inst. Brit. Architects, Ser. 3, Vol. 3, 1896, pp. 1 et seq.

John Todd. Isle of Man.

On the Borings for Coal and the Experimental Salt Works in the North of the Isle of Man. Yn Lioar Manninagh, Vol. 3, 1896, pp. 65 et seq.

W. Tuckwell. Linc. N.

The Lincolnshire Naturalists' Union Boulder Committee [giving a brief account of its formation, etc., and particulars of 102 boulders at various stations in the north of the county]. Nat., Nov. 1896, pp. 349-353.

W. Y. Veitch. York N.E.

Geological Notes of an Excursion made by the [Cleveland Naturalists'] Field Club to Runswick Bay, on June 1st, 1895 [describing the liassic rocks, glacial sections, etc.]. Cleveland Nat. Field Club, Record of Proceedings, 1895, publ. 1896, pp. 12-13.

F. F. Walton. York S.E.

Additional Notes on the Hessle Gravels [particulars of observations made since the author's paper published in 1894 [see Bibliography for that year, published in the Naturalist, March and April 1899, pp. 81-103]. Trans. Hull Geol. Soc., Vol. 2, 1894-5, publ. 1896, pp. 16-18.

F. F. Walton. York S.E.

[Small Boulder of Rhomb-porphyry at] Hessle [in the Boulder clay]. Trans. Hull Geol. Soc., Vol. 2, 1894-5, publ. 1896, p. 8.

W. W. Watts [Secretary; drawn up by]. Northern Counties.

Photographs of Geological Interest in the United Kingdom.— Seventh Report of the Committee, consisting of [16 names; contains particulars of several photographs of sections in the northern counties]. Rep. Brit. Assn. (Liverpool Meeting), 1896, pp. 357-365.

W. W. Watts. See 'G. Elmsley Coke.'

A. E. Wherry. Linc. S.

Lincolnshire Naturalists at Bourne [Geological notes]. Naturalist, Oct. 1896, pp. 294-295.

William Crawford Williamson. York S.W., N.E., and Lanc. S.

Reminiscences | of a | Yorkshire Naturalist | By the late | William Crawford Williamson | LL.D., F.R.S. | . . | Edited by his wife | London | . . | 1896 [contains much of interest to students of Yorkshire Geology]. pp. xii. + 228.

R. Winstanley. Lanc. S.

Permian and other fossils from the Lancashire Coalfield [obtained from a depth of 324 feet in a boring for coal near Abram Hall; exhibited at a meeting of the Manchester Geological Society on 10th March 1896]. Trans. Manch. Geol. Soc., Vol. 24, Part 7, 1896, p. 167.

Henry Woodward. Derbyshire, Lake District.

The Anniversary Address of the President; Life-history of the Crustacea in Later Palæozoic and in Neozoic Times [specimens from the Lake District, Derbyshire, etc., referred to]. Quart. Journ. Geol. Soc., Vol. 52, Part 2, May 1896, pp. xci.-cxviii.

Horace B. Woodward. York S.E.

Note on a Section at the North Cliff, Southwold [comparing a peat bed (pp. 356-7) containing freshwater shells and plants with a similar bed overlying the glacial gravel at Kelsey Hill, in Holderness]. Geol. Mag., 1896, pp. 354-358.

NOTE—FLOWERING PLANTS.

***Cerastium quarternellum* (*Mœnchia erecta*) at Doncaster.**—This afternoon I gathered the above-named plant on the Doncaster Race-course. I noticed it there last spring, but did not recognise the species. During the winter I thought from memory that the little plant I had seen must be *C. quarternellum*, and to-day I verified my supposition. The plant grows on the most elevated and dry part of the course, and in a very limited area is abundant. The specimens are of a small type, averaging 1½ in. in height.—H. H. CORBETT, 9, Priory Place, Doncaster, 7th May 1900.

NOTE—ORNITHOLOGY.

The Cuckoo: its Notes.—The paper on the Cuckoo (*Cuculus canorus*) in the April number of 'The Naturalist,' by the Rev. Edward Adrian Woodruffe-Peacock, is an exceedingly interesting one to students of bird-life.

Mr. Woodruffe-Peacock says:—'They also used other strange notes of anger, surprise, pleasure, or endearment—call them what you will—which are many of them quite unknown even to the majority of bird lovers.'

This is quite true, and in this connection my friend Mr. Thos. Thompson, of Winlaton, county Durham, a most careful and observant life-long naturalist, writes:—

'On the 29th May 1856 I shot my first Cuckoo, a male (and took my first Grasshopper Warbler's nest with six eggs, the first I ever saw, and all of which are still in my possession).

'On that day I saw about one dozen Cuckoos flying and chasing each other. Ultimately they all settled on a large tree, and the variety of notes they uttered was most astonishing, and is correctly described by Mr. Woodruffe-Peacock. I have only seen young Cuckoos fed by Titlarks and Tree Pipits. Old birds which I have shot were, on several occasions, gorged with field black spiders.'

There was a discussion in 'The Field' last year as to whether the Cuckoo ever called when on the wing, and, from the number of letters which appeared, this question was satisfactorily disposed of in the affirmative.

Once in the woods at Riding Mill we heard one calling 'Cuckoo, cuckoo, cook'—'Cuckoo, cuckoo, cook.'—H. T. ARCHER, Newcastle-upon-Tyne, 1st May 1900.

NOTES AND NEWS.

We have been much interested in looking over a series of programmes of the Croft Winter Lectures for six sessions, 1894 to 1900, with which we have been favoured by Mr. Robert Byers, of that place. There have been delivered six lectures each session of really intellectual and edifying quality, and we are glad to learn that they are appreciated by good audiences. Among the scientific addresses that have been given we notice that Mr. Frank Comyns, M.A., of Durham, lectured on 'Water,' the late Mr. James I'Anson, of Darlington, on 'Some Phenomena of Light and Colour,' Mr. W. H. Shrubsole, F.G.S., of London, on 'Curious Dwellers on our Shores,' Mr. W. R. Rae, of Sunderland, on 'Other Worlds than Ours,' Mr. J. T. Proud, of Bishop Auckland, on 'The Migratory Birds of Britain,' Mr. F. Enock, F.L.S., on 'Wonders and Romance of Insect Life,' and Mr. A. F. Hogg, M.A., of Darlington, on 'Flame and Combustion.' This record speaks well for the village, which is classic in the eyes of Yorkshire naturalists by its association with one of the pioneers of Yorkshire botany—the Rev. James Dalton—and the prosperity of these lectures has our every sympathy and best wishes.

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ON THE SNARES OR SNAP-NETS OF THE AMERICAN AND EUROPEAN TRIANGLE SPIDERS (*HYPTIOTES CAVATUS* AND *H. PARADOXUS*).

H. WALLIS KEW, F.Z.S.,
London; formerly of Louth, Lincolnshire.

THE present paper, which does not record personal observations, attempts to bring together certain somewhat scattered information concerning the spinning habits of the spiders of the genus *Hyptiotes,* creatures whose triangular snap-nets present, without doubt, one of the most remarkable types of spider's snare as yet known.

Of the two well-recognised species, *Hyptiotes cavatus** belongs to America, and *H. paradoxus*† to Europe. Both are small inconspicuous animals; and are apparently attached, chiefly, to woods of fir and pine trees. *H. paradoxus* is widely distributed in Europe, ranging from Stockholm to Milan, and occurring also in England, France, Austria, etc. In this country, unfortunately, little is known of it; a single specimen was reported in 1863 from the North of England (Lake District of Cumberland),‡ and this for a long time was the only evidence of the creature's existence in these islands.‖ Within the last four years, however, the Rev. O. Pickard-Cambridge (as that naturalist obligingly informs the writer) has met with this spider in some abundance in the New Forest; and it is possible that the creature occurs in suitable spots in many parts of the country. From its occurrence in Cumberland and in Sweden, new localities for it are as likely to be found in the North as in the South of England, and it is hoped that the present compilation, by calling attention to the creature, may lead to its discovery in Yorkshire or Lincolnshire, or in other counties to which 'The Naturalist' is devoted. The American *H. cavatus,* which also ranges widely, is closely allied to *H. paradoxus,* but the writer is told by Mr. Cambridge, who possesses specimens of both, that the two are quite distinct. Originally found by Hentz in Alabama, *H. cavatus* has been attentively observed by Professor Wilder in the neighbourhood of

* *Cyllopodia cavata*; *Hyptiotes americanus.*

† *Mithras paradoxus.*

‡ Blackwall, Notice of the capture of *Mithras paradoxus* in England, Annals and Magazine of Natural History (3), XIII. (1864), pp. 435-6.

‖ See Cambridge, Spiders of Dorset, 1879-81, p. 533.

Ithaca, New York, and by Dr. McCook in the neighbourhood of Philadelphia and elsewhere; in the opinion of the last-named naturalist it will probably be found to inhabit a great part of the United States.

The snares of these spiders, from their almost unique shape, and from the almost unique fact that they are capable of being 'snapped' by the owner, have naturally awakened deep interest among naturalists;* and it has even been doubted whether it is here or among the symmetrical orb-webs of Epeirids that the snare-making instinct has attained its greatest perfection.†

The general form of the roughly triangular snare will be readily gathered from the accompanying illustrations. The structure is seen to consist of a more or less horizontal trap-line, of four radii, attached distally to a more or less perpendicular base-line, and of a variable though limited number of cross-lines overlaying the radii. The trap-line and one of the radii are continuous, and this thread, presumably, is the original foundation-line of the snare. On the under-side of the trap-line, close to the object to which the line is attached, the spider takes up its position, clinging back downwards, and having, above it, as shown in Figs. 2 and 5, a coil or loop of slack line, furnishing a clue to the snapping-process already alluded to. The little animals possess the cribellum and calamistra, and use these organs in the fabrication of the cross-lines, which constitute the adhesive prey-catching part of the snare.

The earlier accounts of the snare refer to *Hyptiotes paradoxus*, the first with which the writer has any acquaintance being that of Thorell, published in 1860.‡ It was in the neighbourhood of Stockholm, in 1855, that Thorell first met with this spider. July, August, and September were the months in which it was found fully grown; and it occurred principally in woods of trees of the fir kind, especially in pine woods. The following is the account of the snare:—

> Between the dry bare branches of two neighbouring trees, she spins a strong thread in a horizontal direction, from a point of which she afterwards draws obliquely downwards three other threads, which form equal

* McCook, American Spiders and their Spinningwork, I. (1889), p. 180.

† Pocock, Royal Natural History, VI. (1896), p. 223.

‡ Thorell, Till kännedomen om slägtena Mithras och Uloborus, Öfversigt af Kongl. Vetenskaps Akademiens Förhandlingar, XV. (1860), pp. 191-205; the writer quotes from the paragraphs translated by the author in his European Spiders, 1869, pp. 67-71 (Nova Acta Regiæ Societatis Scientiarum Upsaliensis (3), VII., 1870).

angles with the original thread and each other and lie in the same vertical plane. These four threads form the radii of the web; over them are laid concentric cross-threads, 16-22 in number, and tolerably wide apart. The loose net thus constructed forms a circular sector of about 45 degrees with a radius of a foot or more. It is therefore very large in proportion to the spider itself. The animal does not build itself any shelter or nest near the web, but hangs on the first-named horizontal thread that bears the web, near one of the twigs to which it is fastened, and at a considerable distance from the common point of intersection of the radii.

Next we have a note, in 1867, by Ausserer, who found the spider plentifully in the dry pine-woods of the Tyrol. It spins, he says, on coniferous trees, an incomplete orb-web, consisting of but 3-4 radii, and presenting, therefore, the form of an isosceles triangle;* the author is probably mistaken, however, in speaking of 3-4 radii, the number apparently being always four.

In 1872, Sordelli, who does not appear to have been acquainted with Thorell's account, published another descrip-

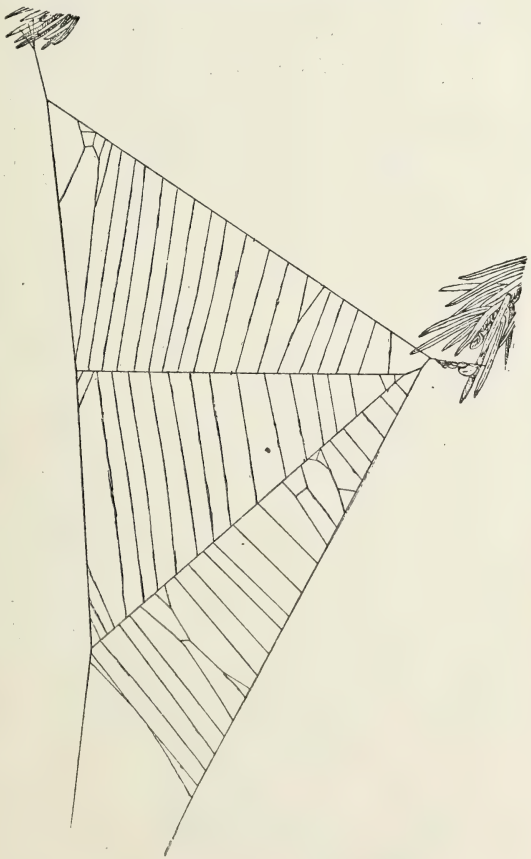

Fig. 1.—The snare of *Hyptiotes paradoxus*; from a sketch taken at Milan in 1871. After Sordelli, Atti della Società italiana di Scienze Naturali in Milano, XV. (1872) Tav. I., Fig. 1. Reduced.

*Ausserer, Die Arachniden Tirols nach ihrer horizontalen und verticalen Verbreitung, Verhandlungen der k. k. zoologisch-botanischen Gesellschaft in Wien, XVII. (1867), p. 150.

tion of the snare, accompanied by an illustration (Fig. 1). In the autumn of 1871 he found the spider within the city of Milan, close to the Museum to which he was attached, and was thus able to observe it at leisure. It begins its snare, he says, by extending an inclined thread between two small branches, in such a manner that the lower end is fixed firmly to the free extremity of one of the branches; and this extremity becomes the pivot of the snare and the point at which the spider remains in observation. From a point upon this thread, more or less near its lower end, the spider sends down another thread, much inclined, towards some lower branch, and placed so as to fall in a vertical plane with the first thread. Then by a third thread, vertical or almost so, the creature joins the first two, forming thus the triangular outline of the snare. From the angle formed by the first two threads are extended in succession two other threads to the opposite side of the triangle, in such a manner that they belong, as a rule, to the second, not to the first, thread. The warp of the snare, consisting of four convergent threads (radii) and a base-line, is now complete. Upon the convergent threads, however, have still to be woven other threads said by this author to be perfectly comparable to the spirals of Epeira, but here reduced to simple segments, instead of embracing a complete circle. These segment-threads (cross-lines) vary in number, from snare to snare, from about 15 to 25. The angle formed by the marginal radii also varies; as also does the size of the whole structure. The parting of the two intermediate radii from the lower marginal radius, not from the upper, and not both from the same, but from neighbouring points, are circumstances believed by the author to be useful in the matter of transmission of vibrations: he thinks that this disposition is calculated the more effectually to make known to the spider the exact part of the snare in which a struggling insect is to be found.*

These authors do not, as far as the writer is aware, make any mention of the snapping process, which American observers fully describe. I am indebted to Mr. Cambridge, however, for the information that his nephew, Mr. Fredk. O. Pickard-Cambridge, who was with him when *Hyptiotes paradoxus* was discovered in the New Forest, observed the habit in this animal

* F. Sordelli, Intorno alla tela ed ai costumi di una specie di ragno (*Mithras paradoxus*), Atti della Società italiana di Scienze Naturali in Milano, XV. (1872), pp. 22-30.

'of gathering the slack line of the snare in its claws, and suddenly releasing it.'

Hyptiotes cavatus, in America, has been more fully studied. Professor Wilder has published two papers on its snare and habits, one in 1873 and one in 1875: both illustrated, and having the advantage of being wholly original, the author being unacquainted with the writings of Thorell, Ausserer, and Sordelli; the second paper embodies the results of five seasons' work.* The subject has been further described and illustrated by Mr. Emerton† and by Dr. McCook.‡ The little spider, which is seen chiefly in late summer and autumn, resembles the European species in its attachment to pine trees. It has been found abundantly by McCook among the mountain pines of Central Pennsylvania; as well as in the flat, sandy, pine barrens of New Jersey; in pine groves on the sea-shore at Ipswich Bay, Massachusetts, etc. But it is frequently found in other situations, the same naturalist having observed it among shrubs and evergreens on the lawns of country residences; in groves of deciduous trees; in the under-bush of Woodland Cemetery, Philadelphia, etc. Wilder found it, in woods, on hemlock twigs; and Mrs. Treat‖ found it, in New Jersey, among flowering-peas, the snare being attached to the dry sticks supporting the plants. In hanging the snare between the branches of trees, the creature generally chooses those which are dry and bare; but this is not a universal preference, the snare being often found among green needles of pine boughs and amidst green

---

* Wilder, The nets of *Epeira, Nephila,* and *Hyptiotes,* Proceedings of the American Association for the Advancement of Science, XXII. (1873), Part 2, pp. 264-74; The Triangle Spider, Popular Science Monthly, VI. (1875), pp. 641-55. The writer has to tender his thanks to Professor Wilder, who most obligingly sent him, from America, copies of these papers (and of other papers on spiders), and gave and obtained permission for the copying of Figs. 4-6.

† Emerton, The cobwebs of *Uloborus,* American Journal of Science (3), XXV. (1883), pp. 203-5; New England Spiders of the family Ciniflonidæ, Transactions of the Connecticut Academy of Arts and Sciences, VII. (1888), pp. 454-7; Structure and Habits of Spiders, 1878, pp. 75-9.

‡ McCook, On the Snare of the Ray Spider (*Epeira radiosa*), a new form of Orb-web, Proceedings of the Academy of Natural Sciences of Philadelphia, 1881, pp. 163-75; American Spiders and their Spinningwork, I. (1889), pp. 180-94, 195-207, III. (1893), pp. 275-7. The writer is indebted to Dr. McCook for permission to copy Figs. 2 and 3.

‖ M. Treat, quoted by McCook, 1889, op. cit., I. (1889), p. 181.

foliage of other plants. The spider, a little dull-coloured creature about one-eighth of an inch long, is by no means uncommon; but it is not easily discovered. When in its usual position under the trap-line, its body is close against the twig to which the line is attached, and its legs are drawn together, so that the animal forms a compact brown mass, about the size and shape of a raisin-seed, much resembling the little projections commonly found on dry twigs.* Even the peculiar snare is apt to be mistaken for a fragment of the snare of some

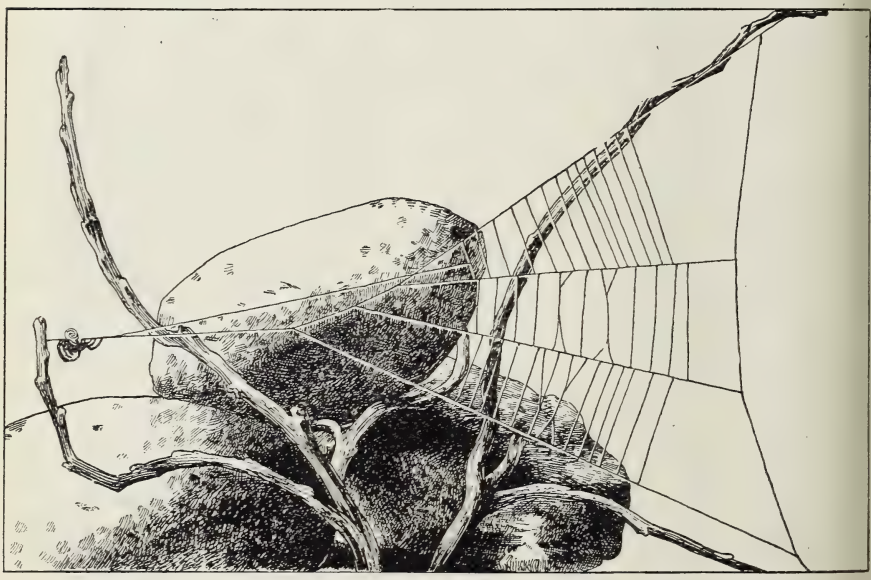

Fig. 2.—A snare of *Hyptiotes cavatus*, spun on a dry bush in a New England stone-fence. After McCook, [American Spiders and their Spinningwork, I. (1889), p. 181, Fig. 169. Reduced.

ordinary Epeirid. 'Strolling through the woods near Ithaca, New York, one October afternoon,' says Wilder, 'I saw, upon a leafless hemlock branch, what looked like a piece of the net of some geometrical spider;' still there was a regularity in the triangular net which did not accord with the idea of its being a fragment, and a closer examination showed that its form and structure were perfect and unbroken; and, moreover, 'instead of hanging loosely from the twigs, it was upon the stretch, as if constantly drawn by a power at one or the other end.'

* Wilder, 1875, l.c.

Fig. 2 (after McCook: reduced) represents a snare of this spider, spun on a dry bush in a New England stone-fence. According to McCook, the structure is usually placed low down, rarely more than three or four feet from the ground. It is generally more or less vertical; but perhaps never absolutely so, being usually somewhat inclined; often, as stated by Wilder, at an angle exceeding 45°; and McCook mentions having occasionally found it more or less horizontal. According to Wilder's papers these snares are the work of females only, the males being believed to get a precarious living by hanging on to the snare of a female; Wilder admits, however, that young males may possibly spin snares; and it has since been ascertained by McCook that the males make snares exactly like those of the females; though here, as in Epeirids, males may sometimes be observed, during the breeding season, about the outskirts of the snares of females. As described by Wilder:—

> The net is triangular in form and consists of four radii, never more or fewer, crossed by several (6-10) *independent* viscid lines; the centre of radiation is prolonged into a single nearly horizontal strong and short line which is attached to a branch or twig; the outer ends of the radii are attached to a second strong line more or less nearly vertical and nearly at right angles with the first.

Or, as stated by McCook:—

> The appearance which the snare presents to the observer is that of a circular sector, attached at the open or outer end to surrounding objects, and at the apex to a straight line of varying length, similarly anchored. The number of radii is always four, never more nor less, and in this number, of course, are included the two outside rays. The two central radii are crossed by lines which may be regarded as the equivalent of the spiral lines which intersect the radii in ordinary orbwebs.

The fact that the radii are constantly four in number is of interest, for uniformity in matters of this kind is exceedingly rare among spiders. In a hundred or more snares examined by Wilder there was no variation in this respect, and very numerous observations by McCook confirm that the number is invariably four. The radii do not, as a rule, diverge from a common point, so that there is ordinarily no true centre of radiation. This want of a common starting-point is well shown in Figs. 2 and 3: both from drawings of actual webs; but it is not indicated in Thorell's description of the European snare, or in Emerton's description and figure of the snare of the present species; Wilder's drawings (Figs. 4-6), moreover, show the radii running from points nearer together, apparently, than is usual in nature. Sordelli's drawing (Fig. 1) makes it clear that a common centre is wanting in the European snare, and in his

description, as we have seen, this author makes special mention of the different points from which the radii diverge; thus the two snares are doubtless similar in this respect, in which, as in every other respect (except as regards the number of the radii), both exhibit considerable variation. The distances between the radii, says Wilder of the present species, the number of the cross-lines, and the distances between them, as well as the dimensions of the several parts of the snare, all vary considerably; in ten snares, the trap-line (exclusive of the coil of slack) varied from less than half an inch to nearly 6 inches; and the triangular net itself from the apex to the base-line, from about 4 inches to more than 8 inches; by McCook the trap-line was found to vary from 1¼ inches to 13 inches; the net from 2½ inches to 13 inches; and one snare measured by this author had a base-line of the extraordinary length of 26 inches. As regards the number of cross-lines, Wilder, as above quoted, gives 6-10, and in his second paper 6-15. Emerton gives 'a dozen or more,' and McCook, while regarding the prevailing number as 16 or thereabouts, notes a range of 5-22. These lines are possibly a little more numerous in the European snare, Thorell, as we have seen, giving 16-22, and Sordelli 15-25. McCook mentions of *Hyptiotes cavatus,* however, that the number is not constant even with the same individual: thus, for instance, a spider having 14 one day, had 19 on the day following. In intersecting the radii, these lines do not pass directly across them, but on reaching each radius they run along with it a little way before starting off on the other side; this condition, well shown in Figs. 4-6, is similar to that obtaining in what is called the notched-zone of certain orb-webs.* The cross-lines are adhesive and highly elastic; Wilder at first supposed them to be beaded like the spirals of Epeirids; but he soon found that this was not the case. He states that they are not provided with a fine floss like the characteristic threads of Amaurobiidæ,† but are merely double lines, the two strands being from $\frac{1}{500}$ to $\frac{1}{2000}$ of an inch apart. This, however, is not in agreement with the findings of Emerton and McCook, who have shown that these lines are flocculent, somewhat after the fashion of the threads of the family just named, the calamistra doing the curling in both cases. Emerton found a smooth thread running through the centre, the flocculent part of the line being arranged

* McCook, 1889, tom. cit., p. 187.

† Ciniflonidæ.

in regular loops; according to McCook there are three strands, viz.: the central smooth thread, and two curled threads, the latter crossing and recrossing above and below, and forming loops. The curled threads are not made separately and attached to an already existing thread as in Amaurobiidæ; both smooth and curled threads being, in the present case, spun at the same time.

The spider appears to prefer to construct its snare just before day. To its early habits in this respect Wilder (who kept many individuals in his house) attributes his failure to observe the whole process; twice he attempted to sit up all night, but the spiders appear to have commenced work just as he fell asleep in the morning. The construction of the warp of the snare—the radii, trap-line, and base-line—was never witnessed by this observer. The original line, as he supposes, is doubtless air-carried. As to the subsequent steps, however, Wilder refrains from speculation; and, referring to Figs. 4-6, merely states that in some way or other the spider connects with the original line (*OE*) four others, constituting the base-line (*BB*), and the three lower radii (R^{II} R^{III} R^{IIII}), which latter are joined to the base-line at *F*, *G*, and *H*. The upper radius (R^{I}) is formed, he adds, by the central part of the original line; and the three others unite with it at *A*, the apex of the triangle. McCook also failed to see the construction of these lines, and the order in which they are spun, by *Hyptiotes cavatus*, has not been observed, as far as the writer knows, by any naturalist. McCook, however, after a careful study of a number of snares, has made suggestions on this point, which may be here repeated. He thinks it probable that the spider first spins a thread represented, in Fig. 3, by the dotted line PB. She may then proceed to attach to this line, say at A, another thread, carrying it along PB to the place of attachment B, thence up the branch or other object to C, where the carried thread would be drawn taut and

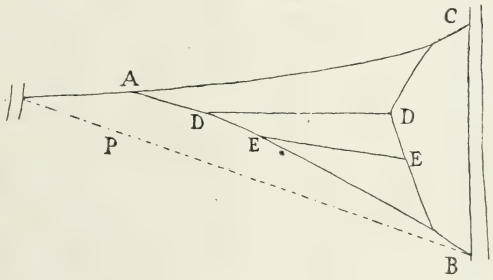

Fig. 3.—Diagram illustrating the possible manner in which *Hyptiotes cavatus* makes the framework of its snare. After McCook, American Spiders and their Spinningwork, I. (1889), p. 183, Fig. 171.

fastened. Thus would be produced the line AC; and the original line, having been drawn upward by pulling upon AC, would assume the curved form of AB. The two marginal radii would now be in position. In the next place, presumably, the spider would drop from the point C to B, carrying with her a thread, which, attached at B, would become the base-line of the triangle CABC. Proceeding along BA, carrying with her a thread as before, she may now make another attachment at E, returning upon her course to B, and thence upward on the base-line to E, where the carried thread would be pulled taut and fastened, and would form the third radius EE; finally, it is supposed, the fourth radius DD would be put into position in a similar way. It is curious to note that while McCook here assumes the lower marginal radius to be part of the original line, Thorell, Sordelli, and Wilder, writing independently, each suppose the upper marginal radius to have this character. Sordelli appears to be the only author other than McCook who has entered into detail as to the order of construction of these lines. His remarks, relating to *Hyptiotes paradoxus*, already quoted, antedate those of McCook by seventeen years, but the latter author does not appear to have been acquainted with them; and it is interesting in this circumstance to find that, with the exception just alluded to, the statements of Sordelli and the suggestions of McCook are practically identical. According to the European author, the line AC (in Fig. 3) is the first, AB the second, CB the third, and DD and EE the fourth or fifth respectively. It is quite likely that this author, having ample opportunities for observation, saw the spider spin the lines in the order thus indicated; but the writer is not clear on this point.

Wilder, fortunately, twice witnessed the construction of certain of the cross-lines. In 1870 he saw the last cross-line (that nearest the apex) finished; and, in 1873, he watched the formation of the last five of these lines. At the time of the latter observation the spider had completed the warp and the first four cross-lines (in the wide basal region of the snare). As the observer took up his position, the creature was passing along the upper marginal radius from the direction of the apex; reaching the cross-line last completed, she turned round, seemed to make rough measurements with her body, and then, by drawing her spinnerets along the radius for a short distance (about 2 mm.) formed thereon an extended attachment. The spider then allowed her abdomen to fall away from the radius;

and, hanging therefrom by the first and second pairs of legs and braced away by the third pair, she began to move the fourth pair simultaneously to and from the spinnerets, so as to extract from them an adhesive elastic line; while doing this, she moved slowly toward the apex, to a point where the inter-radial spaces were narrow enough to permit her to cross to the second radius; this she did, ceasing at the same time to draw out the line, which, as she now returned toward the last completed cross-line, contracted considerably, so that it was nearly of the proper length when the creature attached it to the second radius at

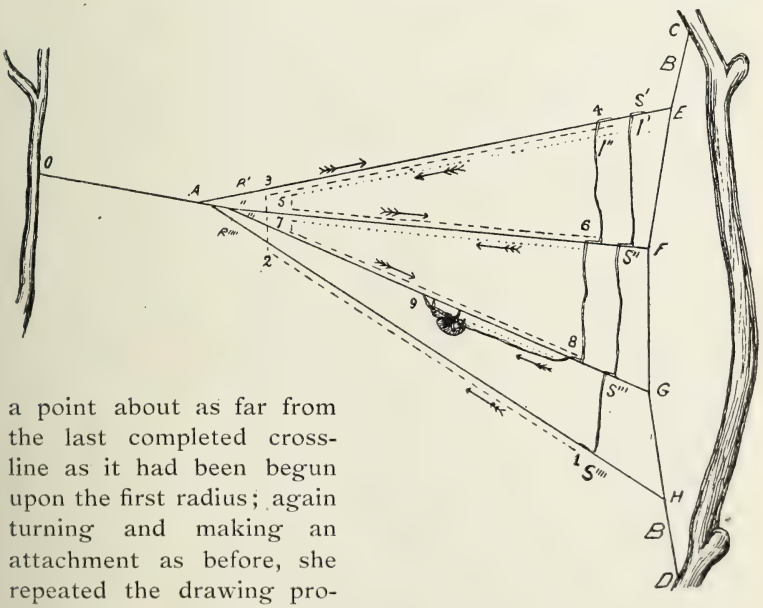

Fig. 4.—The snare of *Hyptiotes cavatus* in process of formation. After Wilder, Popular Science Monthly, VI. (1875), p. 649, Fig. 8.

a point about as far from the last completed cross-line as it had been begun upon the first radius; again turning and making an attachment as before, she repeated the drawing process so as to carry the elastic line to the third radius, and from this to the fourth radius. The fifth cross-line was thus completed, and the spider, ceasing to draw out line, returned by way of the apex to the first radius, and began to spin a sixth cross-line, and afterwards a seventh, eighth, and ninth, all in the same way and at about the same distances apart. In the earlier more limited observation, the process, as far as it was seen, was identical; and the observer concludes that the method here indicated is the normal one; he assumes, moreover, quite safely no doubt, that the longer cross-lines (the construction of which he did not see) are put in in the same manner. The process is certainly

curious, and well worth understanding; in his second paper Wilder illustrates it by a drawing (Fig. 4),* based upon the observations just noted, but referring, for convenience, to the longer cross-lines. In this drawing, the warp of the snare, and the first cross-line (I^{1}) are in position; and the manner of the subsequent movements of the spider are indicated by the numerals 1 to 9, and by the interrupted lines and arrows. The dashed line 1, 2, 3, 4, shows the route followed in order to commence the second cross-line (I^{11}). The dotted line 4, 5, represents the spider's track while spinning the first section of this cross-line; the dashed line 5, 6, shows her return to the proper point for attaching it. The dotted line 6, 7, and the dashed line 7, 8, in like manner indicate the track passed over in forming the second section of the same cross-line. The dotted line 8, 9, shows the progress of the spider towards making the third section. Thus, instead of beginning the second cross-line at S^{1111}, the spider begins it at 4; and instead of climbing up the first cross-line (I^{1}) or the strong and convenient base-line (BB), she runs to the point 2 near the apex, crosses the two intermediate radii, and passes along the upper radius (R^{1}) to the attachment of the first cross-line (S^{1}). On reaching this, she turns and forms the attachment of the second cross-line (I^{11}). Then applying the hind legs to the spinnerets as above described—moving them with great rapidity, at least five times a second, or 300 times a minute—the creature begins to spin the line, slowly moving the while along the radius until she reaches the point 5, where she can step across to the next radius (R^{11}). Ceasing to lengthen the line, she now runs along the second radius to the point 6, nearly under that whence she started. Again turning about, she here attaches the line to the second radius; and, recommencing the spinning process, she advances toward the apex, crosses at 7 to the third radius (R^{111}), runs out to 8, and attaches the line to the third radius. She then repeats, under this radius, the process of drawing out a line, and is represented, at 9, as having spun about half of it. It is necessary to remember that the spider, in the drawing, is not reduced like the snare; and that, in nature, the creature is

* In Figs. 4-6, the spider is of natural size, but the snare is considerably reduced; BB is the base-line, attached at C and D, to a hemlock branch; E F G H, points of attachment to the base-line of the four radii, R^{1} to R^{1111}, which converge at A, the apex of the snare; I^{1} to I^{11} [to I^{1x}], the cross-lines; S^{1} to S^{1111}, attachments of the first cross-line upon the radii; O, origin of the trap-line from a second branch.

unable to step from one radius to another except near the apex. It will be seen, Wilder adds, that by first making the cross-line nearest the base, and afterwards the others in their order, the spider avails herself of the fact that a less and less distance has to be successively gone over before crossing from one radius to the next; whereas, if she made the shortest cross-line first, she would be liable to entangle the others if she crossed at the apex; or, if she went round by the base-line, the distances to be gone over would decrease inversely to the length of the lines to be drawn out, that is, the shorter lines would have to be carried and stretched the greater distances, and vice-versâ; but in the method which the spider adopts the distances, as we have seen, conveniently decrease with the length of the cross-lines themselves. As to the time required for the construction of these lines, Wilder mentions that those he saw spun (the five lesser ones) occupied the creature about ten minutes; the other longer ones, he thinks, may have taken twice as long, so that half-an-hour or more is probably occupied in the putting in of the whole of the cross-lines; during this time, Wilder estimates, the hind legs probably move over the spinnerets not less than 9,000 times.

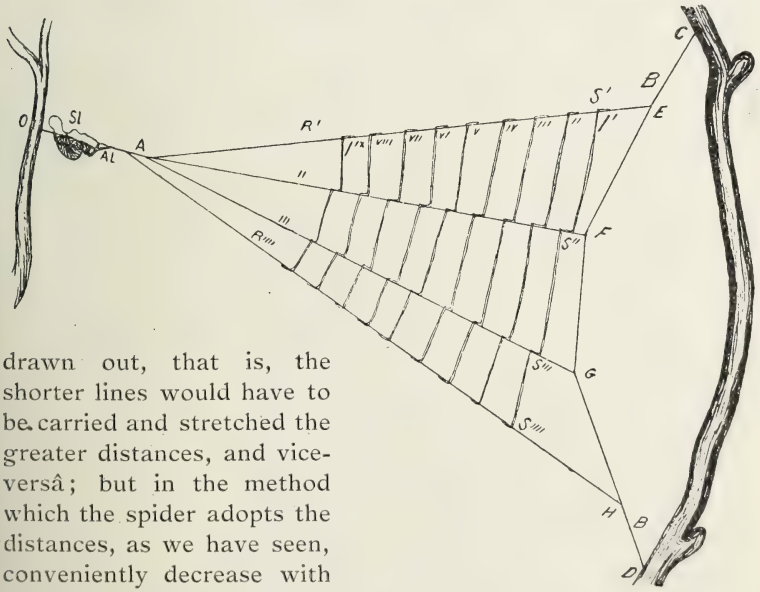

Fig. 5.—The snare of *Hyptiotes cavatus* upon the stretch. After Wilder, Popular Science Monthly, VI. (1875), p. 642, Fig. 1; Proceedings of the American Association for the Advancement of Science, XXII. (1873), Part 2, p. 207, Fig. 2.

The manner in which the spider uses the snare is fully described by Wilder, whose remarks on this part of the subject,

illustrated by Figs. 5 and 6, are based upon often-witnessed proceedings of many different individuals. The response to a continued disturbance of the snare by suitable prey, he says, is so sure that an observer may at any time witness the creature's operations.

As soon as the snare is completed, the spider, without a moment's rest, takes up her position under the trap-line (Fig. 5, *AL*), a little way from the point of attachment (*O*), with her head towards the snare. Firmly grasping the trap-line with the first and second pairs of feet, she pulls herself backward, by means of the hind pair of feet, until she reaches the point of attachment, into which, or into the trap-line near it, she fixes the hind feet. She has thus hauled in that part of the trap-line which intervenes between the point of attachment and the point grasped by the first and second pairs of feet; and this part of the line is now furled up above the creature in the form of a loop of slack (*Sl.*), which is held away from the body by the short legs of the third pair. This proceeding, of course, draws the snare towards the point of attachment, and puts it upon the stretch, the two intermediate radii (R^{II} R^{III}) and with them the central portion of the base-line (*BB*) being most affected. The strain put upon the structure is considerable; yet the spider often remains motionless for hours, perhaps for days, constantly holding the snare taut and ready for action.

After an insect has flown into the snare, the spider releases the slack of the trap-line, and the remarkable snapping process already alluded to is effected:

Our spider's ability to keep still is fully equalled by her capacity for action when the moment arrives; and yet she is by no means hasty; as a general thing (the exceptions being due perhaps to hunger, or inexperience), the vibration of the net by an insect must be pretty decided, and at least once repeated, before the spider feels justified in springing her trap; and when, as may sometimes happen naturally, but more often through experiment, a large or fierce insect is put into the net, nothing will induce the spider to budge; she will suffer her net to be wholly destroyed rather than expose herself or her reputation (?) to a doubtful encounter. Let us suppose, however, that a common fly, or a gnat, or a moth, has struck the net in passing—it may have touched a single cross-line*—but this adheres with the greatest tenacity, and is so elastic as to yield without breaking, so that each struggle involves the victim still more, and may even bring it into contact with the next cross-line. As soon as the violence

* Here, and elsewhere, Wilder does not use the term 'cross-line,' but writes instead 'double-line,' or 'interradial'; for the sake of uniformity I have ventured (without the usual indications) to suppress the latter terms in favour of the former.

and repetition of the vibration indicate that an insect is really entangled, the spider awakes from her apparent apathy; she lets go with her hind feet; the net, released from its tension, flies forward, and at the same time flaps from side to side. The comparative inertia of the fly causes the two or three cross-lines next to it on the side toward the apex to be, as it were, propelled against it, and the entanglement is aided by the sidewise flapping already mentioned; as may be imagined, all this is pretty apt to involve the fly beyond the possibility of escape; but, if the spider does not feel certain of this, she creeps backward again, foot over foot, as before, and again springs her net; and this I have seen repeated in quick succession

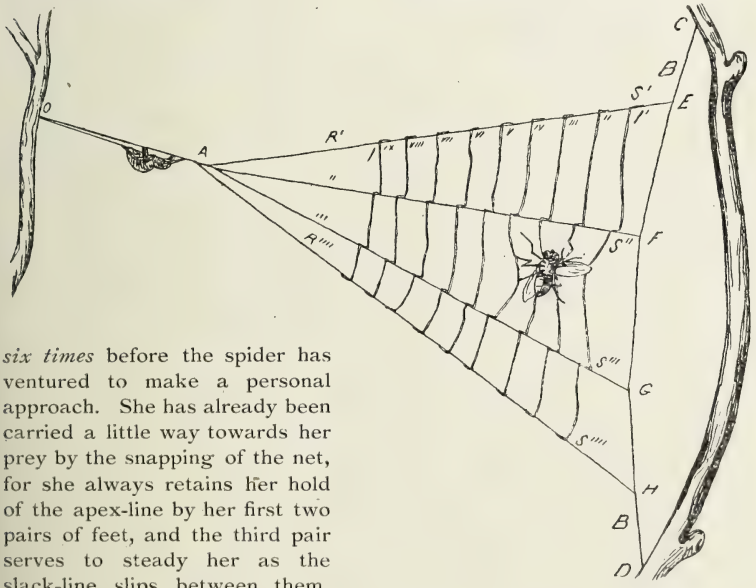

Fig. 6.—The snare of *Hyptiotes cavatus* relaxed for the entanglement of prey. After Wilder, Popular Science Monthly, VI. (1875), p. 651, Fig. 9.

six times before the spider has ventured to make a personal approach. She has already been carried a little way towards her prey by the snapping of the net, for she always retains her hold of the apex-line by her first two pairs of feet, and the third pair serves to steady her as the slack-line slips between them. Advancing now to the junction, she seems to ascertain the exact location of the fly by pulling upon the radii.*

The snare as it appears when relaxed is shown in Fig. 6; comparing this with Fig. 5 we see that the base-line is now more nearly straight; and, the loop of slack having disappeared, the trap-line is taut.

* Wilder, 1875, l.c. In the paper of 1873, the snapping process is thus described: by the loosing of the fourth feet, 'the strain is relaxed and the whole net regains its original condition with a sharp snap, which causes the elastic lines to vibrate in all directions and generally entangles two or more of them upon the insect; should this first attempt fail, the spider, which has been carried sharply forward with the line . . . again walks backward and again lets go; this is sometimes repeated six times in quick succession.'

Having decided as to the location of the entangled insect, the spider, Wilder continues, runs along the nearest radius; and sometimes, when the prey is small, or hopelessly entangled, merely pulls it up by means of the lines about it, and carries it to her accustomed station under the trap-line to be eaten. But more often the creature adopts a method of securing her prey believed by this observer to be peculiar to *Hyptiotes*:

Before reaching the apex (*A*), she cuts with her jaws the apex-line, but, as she keeps constant hold in front of the cut by her first and second pairs of feet, and has a communication in the rear through the line which most spiders always attach to a point behind them, she does not fall, neither is the net loosened beyond a certain limit; it usually seems to recoil about an inch; this recoil tends to entangle the prey like the original snaps of the net. The spider again advances, gathers the radii together and cuts them all, still keeping the line out behind; again the net recoils and collapses. Again she advances and cuts the radii; the net is now hardly distinguishable as such, and is falling together about the devoted fly; the spider now spreads her legs, gathers the net between them and flings it like a blanket over her victim; struggles are now in vain; but, 'to make assurance doubly sure,' the spider grasps the mass, transfers it to her third pair, and with them turns it over and over as a ball, hanging the while by her front legs, and, with the hinder pair used now *alternately*, drawing out from the expanded spinners broad sheets of silk which, relatively to the power of the fly, are like steel bands upon a man. Having in this way reduced the prey to a rounded ball, in which its limbs are hardly distinguishable, the spider takes it in her jaws and mounts to her place.

Thus, whenever this procedure is adopted, and in fact generally, the entire snare, made as it is with much labour and skill, is wholly destroyed in the capture of a single insect.*

McCook, also, has written on the manner in which the snare is used. One gathers that the just-quoted account of the way in which an insect is approached agrees with this author's experiences; but he does not regard the process as peculiar to *Hyptiotes*. Epeirids, he says, behave in a similar manner, and in capturing, swathing, and cutting out an insect they often destroy a sector of the snare consisting, sometimes, of as many as four radii: *Hyptiotes*, possessing only such a sector, destroys the whole snare. In many respects McCook's observations afford a general confirmation of those of Wilder; there are, however, certain points of difference in the two accounts. Examining the spider with a lens in its position under the trap-line, McCook found that between the second and third pairs of legs the line was usually taut, not slack as shown by Wilder, the slack being accumulated, in a considerable coil, between the

* Wilder, 1873, l.c.; 1875, l.c.

third and fourth pairs only. About three-quarters of an inch of line, according to McCook, is rolled up in this coil. Wilder, it will be remembered, attributes the tightening of the snare, brought about by the accumulation of the slack, to the pulling action of the hind pair of feet; but McCook, while admitting that the movements are very rapid and difficult to follow, says that the spider appears first to draw upon the trap-line with the fore feet, placing one before the other, as a sailor ascends a rope hand over hand; and, at the same time or immediately thereafter, she appears to execute a similar movement with the two hind feet, only reversing the direction. As regards the manner in which the snapping of the snare is effected, the result of Wilder's observation was, as we have seen, that the slack is released by the loosing of the hind pair of feet; and that the spider, which does not unclasp her fore feet, is carried forward with the snare. McCook's statement, however, is that the creature releases the coil by unclasping simultaneously all the fore feet and those of the third pair; the hind feet, he says, 'hold to the trap-line and never let go until the spider abandons her position to visit the snare in search of prey;' and thus, he adds, the spider, though appearing to shoot forward with her snare, really remains stationary, or advances but a trifle.* McCook mentions, amongst other things, that he was successful in making the creatures exhibit the snapping process by touching them gently with a pencil; and it might be reasonably supposed that he attended carefully to the subject; but one is somewhat puzzled on finding that in a subsequent part of the work in which these observations are recorded he repeats a statement—made by him in a former publication†—which is in agreement, not with his own, but with Wilder's findings. The writer has had no opportunity of clearing up these points, to which, obviously, a future observer might usefully give attention.

We have still to compare the snare of *Hyptiotes* with those of other spiders. A glance at the figures will have been sufficient to suggest that this remarkable triangular net is none other than an incomplete, modified orb-web; and that this is the case has been maintained by Thorell and others, who entertain no doubt that the comparison thus made expresses a true relationship.

* McCook, 1889, l.c.

† McCook, 1882, l.c.

Hyptiotes, though anomalous, has undeniable affinity with *Uloborus*; and from various considerations, especially in view of the presence of the cribellum and calamistra, these two genera have been placed by a number of arachnologists, including Blackwall, among the tube-weaving spiders, in or near the Amaurobiidæ;* and this has been done even by Ausserer and Emerton, who were acquainted with the character of the spinning-work. Thorell, however, who has paid much attention to the classification of spiders, has no hesitation, on structural grounds, as well as with regard to habits and industry, in placing *Hyptiotes,* as well as *Uloborus,* among the orb-weavers; he makes for these genera a sub-family Uloborinæ, of equal value with Epeirinæ, which together make up the great family Epeiroidæ of this author; other recent authorities, I believe, though they break up the family, speaking of Epeiridæ, Uloboridæ, etc., do not venture to disturb the general relationship which Thorell's classification implies. It is interesting in this connection to recall that the snare of *Uloborus,* unlike that of *Hyptiotes,* has the *appearance* of an ordinary full-orb.

Although the snare of *Hyptiotes* is so peculiar and so unlike that of any other known spider, it is easily seen, says Thorell, that it cannot be looked upon as a separate or independent form of web, and that, on the contrary, it must be classed with the orb-webs of other Epeiroids; 'here, as with them, it consists of radii diverging from a point, united by threads running concentrically; the difference is simply that, whereas with the other species belonging to the family it forms a closed circle, with *Mithras* [*Hyptiotes*] it is but a circular sector.' A transition, Thorell adds, 'may in a certain sense be looked for in the case, of which one sometimes meets with examples, where, in the common circular net, the interval between two radii is left open by the circular threads being terminated at these radii.' The author here refers, evidently, to 'sectoral orbs,' which are well represented, not only by *Nephila,* but also by *Zilla,* in which latter the small uncrossed sector is traversed by a single free-radius or trap-line. Another more evident transition, Thorell thinks, is furnished by a web noted by Darwin in a lofty valley of the Cordillera, near Mendoza; this singularly-formed snare consisted of strong lines radiating in a vertical plane from a common centre, where the spider had its station; two of

* Ciniflonidæ.

the rays only were connected by a symmetrical mesh-work; 'so that the net, instead of being, as is generally the case, circular, consisted of a wedge-shaped segment. All the webs were similarly constructed.'* Wilder, independently, has also compared the *Hyptiotes*-snare with the orb-webs of Epeirids, especially with the sectoral-orbs of *Nephila* and *Zilla*. Ideally, he says, one may at once draw a comparison between the triangle of *Hyptiotes* and the orbs of *Epeira* and *Nephila*; for the snare of *Epeira* is a complete circle, that of *Nephila* a circle lacking its upper sextant, while that of *Hyptiotes* is just about the sextant or sixth of a circle: the snare of *Epeira* is an entire pie, that of *Nephila* is a pie with a piece cut out, while that of *Hyptiotes* represents the missing piece: *Nephila* + *Hyptiotes* = *Epeira*. The triangular net, this author thinks, may perhaps be a further specialisation from the sectoral-orb of *Nephila*, the circle of *Epeira* being now reduced from five-sixths to one-sixth of its area; and a comparison with the sectoral-orb of *Zilla*,† he observes, is even more striking, for if we imagine the *Zilla's* snare to be reduced from many radii to four, its free radius clearly represents the trap-line of *Hyptiotes*. Wilder is not satisfied, however, that these analogies involve any real zoological relationship; he points out that the *Hyptiotes*-snare differs from others in having a fixed number of radii; and that the entire independence of the cross-lines is in strong contrast with the spiral or looped cross-lines of the orb-webs. It will be remembered that the cross-lines of *Epeira* consist for the most part of a continuous spiral, and those of *Nephila* and *Zilla* of continuous loops running partly round the web, backwards and forwards, turning when the margins of the open sector are reached; these lines, further, are got into position by means of unadhesive scaffoldings. To be strictly comparable, *Hyptiotes* would have to lay down a similar scaffolding, and carry the adhesive line backwards and forwards from the upper to the lower marginal radius, from the lower to the upper, and so on in continuous loops; but, as we have seen, nothing of this kind occurs, the independent cross-lines of *Hyptiotes* being all commenced on the upper and finished on the lower marginal radius. The nature of the cross-lines, moreover, is absolutely dissimilar: beaded in *Zilla* and other Epeirids, and flocculent in *Hyptiotes*; but the importance of this distinction, perhaps, is diminished by

* Darwin, Beagle Journal, ed. 2, 1845, p. 38.

† *Epeira calophylla*.

the fact that the cross-lines of the full-orb of *Uloborus* are not beaded as in Epeirid-orbs, but flocculent as in *Hyptiotes*.

With regard to the snapping operation—commonly supposed to be peculiar to *Hyptiotes*—it is true that nothing clearly comparable is known among ordinary typical orb-weavers. Many of these latter, however, vibrate and even suddenly jerk their snares: according to Blackwall the Epeirids pull with their feet the radii immediately in connection with the part of the snare in which prey is entangled; and, suddenly letting go their hold, they thus produce a vibratory motion in the snare;* Wilder has observed that 'ordinary *Epeiridæ*, as well as *Nephila*, are accustomed to vibrate their snares, when touched by insects;'† and many, perhaps all of them, 'sometimes seize several radii in their claws, and draw them up and let them go suddenly';‡ McCook states further that Epeirids, as they move cautiously toward their prey, sometimes pause and give two or three quick jerks; and those which, sitting in their dens, hold a trap-line in their claws, 'frequently pull upon it, increasing the tension by drawing it towards themselves, and then letting it go again, making a series of rapid jerks.' In these cases, however, as McCook adds, there is no coil of slack and no true snapping of the net. Moreover, the purpose of these movements does not seem to be that of increasing the entanglement of prey; for, while one can well imagine that such movements may often contribute to the embarrassment of a captured insect, McCook, who appears to have given considerable attention to this point, was never able to observe that such was the case.‖ All things considered, however, one cannot resist the conclusion arrived at by Wilder that the habits now mentioned may be the basis of the remarkable method by which *Hyptiotes* assures the entanglement of its prey.§

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* Blackwall, Researches in Zoology, ed. 2, 1873, p. 288.

† Wilder, 1873, l.c.

‡ Wilder, 1875, l.c.

‖ McCook, 1889, tom. cit., pp. 195-207, 248-9, 338-9. Blackwall observes that Epeirids seldom fail by these means to excite ensnared insects to action, and guided by the struggles thus brought about the spider runs along the most contiguous radius to seize the victim; by these means also the spider probably ascertains, in the first instance, whether the entangled object is animate or inanimate (Blackwall, 1873, l.c.), and according to McCook, she appears also to determine the weight and energy of the victim in the same way. (McCook, 1889, l.c., p. 338.)

§ Wilder, 1873, l.c.; 1875, l.c.

This method, we find in conclusion, is not absolutely peculiar to *Hyptiotes*. It has been ascertained by McCook* that the little aberrant orb-weaver *Theridiosoma radiosum*† is in the habit of snapping its peculiar snare in a manner clearly comparable to the action of *Hyptiotes*. *Theridiosoma* was formerly regarded as belonging to the Retitelariæ, or as a connecting link between that tribe and the orb-weavers,‡ and though now looked upon as an orb-weaver, it should be noted that, being ecribellate, it is not of the family of Uloborids and thus not closely related to *Hyptiotes*. The snare is a vertical orb, the radii of which make up more or less distinct sectors, with axes meeting at the centre, from which runs a more or less horizontal trap-line. The spider takes up its position at the centre, resting partly on the trap-line, and looking away from the snare, not towards it as in *Hyptiotes*; the third and fourth pairs of feet command the axes of the sectors, while the two front pairs are extended along the trap-line. In its relaxed condition the snare is flat, but the spider habitually bows it, shortening the trap-line by accumulating a coil of slack between the fore pairs of legs or between these and the hind pairs; the snare is thus made taut, the centre being drawn inward until at last the whole structure takes the form of a cone or funnel. When the adhesive lines are struck by an insect, the spider, as described in detail by McCook, often springs the snare; and this it does by releasing the grasp of the fore feet upon the trap-line, whereupon the slack sharply uncoils, and the snare unbends and shoots quickly forward, instantly changing from the bowed form to the circular plane, and carrying the spider with it tail foremost. As in the case of *Hyptiotes*, the process is repeated if necessary, and the spider does not leave its position until it believes the prey to be well entangled.

Postscript.—Since writing I have been favoured with a note from Mr. Warburton, in reply to an inquiry on the occurrence of *Hyptiotes paradoxus* in the New Forest. It is to Mr. Warburton that the credit of the rediscovery of the creature in England belongs‖; he found it in August 1894, near Brocken-

* McCook, 1882, l.c.; 1889, l.c., pp. 195-207.

† *Epeira radiosa*.

‡ Cambridge, Spiders of Dorset, 1879-81, p. 427.

‖ O. Pickard-Cambridge, Proceedings of the Dorset Natural History and Antiquarian Field Club, XVI. (1895), p. 116; F. O. Pickard-Cambridge, Naturalist, 1895, p. 33.

hurst (New Forest); but, taking the specimens by beating, he did not observe the snare. The Rev. O. Pickard-Cambridge, who visited the spot in June 1895, again collected the animal, finding numbers (immature) on dead lichen-covered branches of bushes of blackthorn and whitethorn; one was seen in its snare, and Mr. Frederick O. Pickard-Cambridge, by whom the elder arachnologist was accompanied, had the satisfaction of witnessing 'the sudden release by the spider of its trap-line, while at the same time it gave a sudden leap forward in the direction of the snare.'* Later, in July, adult specimens were obtained, but not without trouble, for the spider 'makes its snares among the dead lichen-covered twigs of almost impenetrable bushes of blackthorn and whitethorn, and is most difficult

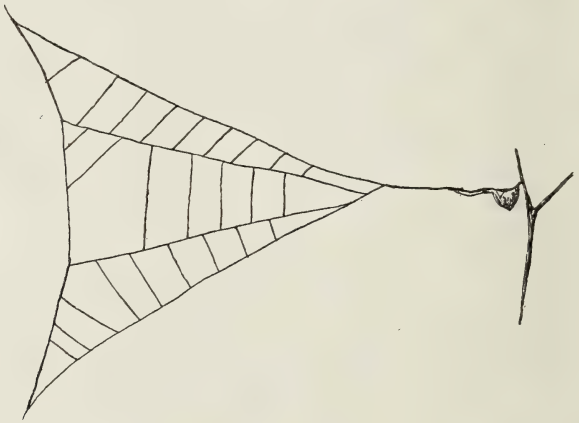

Fig. 7.—Sketch, from nature, of the snare of *Hyptiotes anceps*. After Castelnau, La Feuille des Jeunes Naturalistes, XXVII. (1897), p. 108. Reduced.

to obtain without getting right into the middle, underneath the thickest part of the bushes.'†

I may perhaps be permitted, finally, to call attention to a paper (previously overlooked by me) in which Mr. J. Castelnau, of Montpellier, writes of the habits of another European species, the *Hyptiotes anceps*.‡ The snare of this species, of which a rough sketch from nature is given, is of the characteristic

* O. Pickard-Cambridge, ibid., p. 126.

† O. Pickard-Cambridge, ibid., XVII. (1896), pp. 55-6, 61.

‡ J. Castelnau, Notes sur *Hyptiotes anceps*, La Feuille des Jeunes Naturalistes, XXVII. (1897), pp. 107-11.

triangular form, and has, like the snares of the other species, four radial lines (Fig. 7). It may well be compared, says Castelnau, to the snare of the fowler, for the spider can at will tighten or relax it. This, of course, is a reference to the springing process, a subject on which our author discourses at some length. There is a discrepancy, it will be remembered, between Wilder's and McCook's accounts of this process, as seen in *Hyptiotes cavatus*; and we have now to note that Castelnau's account for *Hyptiotes anceps* differs from both. When the spider is in position at the extremity of the trap-line, Castelnau says, this line is not attached to the twig near which the spider hangs, but is seen, on careful observation, to terminate between the animal's first two pairs of feet; the spider, the while, is attached to the twig only by the thread which runs from its spinnerets. It is this latter thread, according to Castelnau, which the spider—clasping it with the feet of the fourth pair—loops up into a coil, and which she releases (by unclasping the feet behind the coil) when she springs the snare; in this action, one learns, the spider immediately swings forwards, by reason of her own weight, a distance equal to the length of thread looped up in the coil, and the snare which she had been holding taut is thus at once relaxed.

NOTE—DIPTERA.

***Sphegina clavipes* near Grimsby.**—*Sphegina clavipes* has recently been taken in the Grimsby district.—A. Smith, 5, Cavendish Street, Grimsby, 12th June 1900.

NOTES—ODONATA.

***Ischnura elegans* near Lincoln.**—At Burton-by-Lincoln, *Ischnura elegans*, 'A very small specimen (G. T. Porritt),' was taken by me, 18th June 1898.—J. Eardley Mason, Lincoln, 17th June 1900.

Swarm of Dragonflies at Grimsby.—At Grimsby quantities of *Libellula depressa* were seen about on the afternoon and evening of Sunday, 10th June, probably a migration.—A. Smith, 5, Cavendish Street, Grimsby, 12th June 1900.

NOTES—COLEOPTERA.

***Telephorus paludosus* near Grimsby.**—*Telephorus paludosus* has recently been taken in the Grimsby district.—A. Smith, 5, Cavendish Street, Grimsby, 12th June 1900.

***Rhagium bifasciatum* on the Summit of Helvellyn.**—As illustrating how far insects will fly, I found this wood-feeding species on the summit of Helvellyn to-day, weather fine and sunny. It was settled on the face of the Gough memorial-stone, fully 3,000 feet altitude.—W. Denison Roebuck, Keswick, 18th June 1900.

NOTES—ORNITHOLOGY.

Little Gull at Withernsea.—Mr. Chas. Couldwell showed me in his collection a Little Gull (*Larus minutus*), which was shot at Withernsea after a storm three or four years ago.—J. W. STATHER, 16, Louis Street, Hull, 28th May 1900.

Ruff at Bottesford Moors.—A Ruff (*Machetes pugnax* Linn.) was taken at Bottesford Moors (Div. 2) about 1845. My father says it was a beautiful bird, the ruff shading off from light grey to white. It was kept and fed in a room for some time, but what became of it my father does not know. The men who caught them to sell on the moors in the Isle (Div. 1) used to shut them up in a room, and they would live happily enough together, if each had its separate box or plate for food. If this were not done, those which were not provided for would die of starvation. Is this fact or folk-lore?—E. ADRIAN WOODRUFFE-PEACOCK, Cadney Vicarage, Brigg, 11th May 1900.

Incubating Habit of Robin near Brigg.—Here, at Cadney, we have a Robin's nest containing six eggs. It is situated among some creepers that are held up to the wall by trellis work. The wall faces south. During the heat of the last few days the bird frequently left the nest or sat on the side of it, leaving the eggs exposed. Does she do this in order that the eggs may not be over-heated and thus spoil their chance of incubation? I notice, too, that she often perches on the bough of an apple tree and hawks for flies like a veritable flycatcher, but this habit is common to several of our smaller birds. How often may the Grass-Chat be seen perched on the dried last year's thistle or stem of hemlock, from which point of vantage it hawks for flies and insects.—MAX PEACOCK, Cadney, Brigg, Lincolnshire, 12th June 1900.

Bird Destruction in Winter.—Many years ago a farmer at Bottesford, Div. 2, after laying a train of small seed and chaff, posted himself so as to obtain a shot along the line of feeding birds during winterly weather. The gun used was an eight-bore flintlock, with a 3 ft. 4 in. barrel, charged with 4 ds. of powder and four pipe-heads full of dust shot, say 3½ oz. He fired twice and killed 113 birds as the result. I myself counted the following number of species :—

Sparrows, 38.	Goldfinches, 5.	Great Tit, 1.
Greenfinches, 24.	Tree Sparrows, 5.	Blue Tits, 2.
Blackbirds, 9.	Hedge Sparrow, 1.	Chaffinches (hens), 10.
Larks, 13.	Redwings, 2.	Pigeons (dovecote), 3.

—MAX PEACOCK, Ivy House, Bottesford, Doncaster, 28th May 1900.

Birds that Nested in the Yaddlethorpe Gravel Pits in 1887.—During the spring and summer of that year I spent much time noting the bird life of this quiet spot. I find that the birds which nested in the sides of the cliff in Rabbit or Sand Martin holes were the following :—Jackdaws (3 pairs), Stockdoves (3), Swifts (5), Sand Martins (in great numbers), Kingfisher (1), Wheatear (1), Starlings (in numbers). The pit is situated about 60 yards from Bottesford Beck in an enclosure with high hedges on three sides, the beck forming the other. Three acres and a half of sandy gravel with whin bushes and scattered whitethorn trees lie within the fences. There I found the following birds incubating :—Robin (1) on grass-covered cliff-side ; Yellow Wagtail (1), meadow on beck-bank , Pied Wagtail (1), with young Cuckoo in nest on beck-bank ; Linnets (3) and Thrushes (2) in the whin bushes ; Ring Dove in ivy-covered ash tree ; Goldfinch in small Dutch elm; Whinchat (1) at the foot of a clump of thistles; Partridge (1) at the foot of a thorn bush ; French Partridges (2) in rough grass at the top of pit ; Yellow Buntings (1) on beck-bank under a thorn bush. With the single exception of the Kingfisher, I believe, all might be found again this season when their different times for nesting arrive. Bottesford parish is a very land of birds still.—MAX PEACOCK, Ivy House, Bottesford, Doncaster, 31st May 1900.

THE WILD CHERRY (*PRUNUS AVIUM*).

P. Q. KEEGAN, LL.D.,
Patterdale, Westmorland.

As this tree may in many respects be regarded as one of the glories of the Lake District, I have considered that a kind of monograph of its chief structural and physiological peculiarities would be presentable and of some interest. In the first place, it will hardly be necessary to dwell upon the general descriptive features, systematic affinities, and so on, as these must be abundantly familiar to all students of botanical science. I propose, therefore, to pass in successive review the axial organs (stem, root, etc.), then the foliar organs (leaves), and lastly, the reproductive organs (flower, fruit).

Stem and Root.—The wood of the stem is hard, heavy (specific gravity 0·579 to 0·785), and tenacious, with a white, distinct, slightly thick alburnum, and a clear brownish-red duramen. The following histological features are presented:—The vessels are small and narrow (about 40 micro-mm. average diameter) and with the strongly-thickened fibres are grouped partly isolated and partly irregularly throughout the entire annual layer, but the former are larger and more numerous in the (inner) spring wood; parenchyma occurs beside the vessels and between the fibres in the spring wood, but is rather scanty; the medullary rays as seen on the tangential section are long pointed spindles (about 60 rays in a square mm.) ten to twelve cell-layers high and up to six layers wide, the cells being rectangular, thick-walled, porous, and radially extended. The bark exhibits a very remarkable structure; the cambium is not sharply or clearly defined, and it is pierced by the medullary rays which continue uninterruptedly into the bast as white tough bands with cells not so stout; what may be called the ground-mass of the bast-layer is formed of what has been termed 'hornbast,' i.e., the walls of its cells have grown and thickened so very rapidly that, in default of space, they become folded in a wavy shape and at the same time their cell-space is contracted so as to assume a stellate shape, or at times appearing as a labyrinthine or serpentine line, the whole forming an apparently homogeneous mass interspersed with fine wavy lines as in horn; in this ground-mass lie the bast-fibres which, especially in the young bast, form concentric zones lying at fixed distances apart, also bast-parenchyma

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sometimes in worm-shaped rows and formed of rather broad, round, and moderately thick-walled cells; scleroblasts also occur here in a distribution very irregular; in short, the entire bast-layer possesses a very singular and almost unique radiated-lamellar structure, as it has been described, forming generally a series of parallel zigzag lines deviating alternately to and from the side of the strongly curved bast-medullary rays. The periderm is sub-epidermic and composed of uniform flat-celled integuments of cork which are extremely tough, and resist for a long time the action of the weather; hence when, through the pressure of the expanding wood elongating their walls, they finally burst, they adhere to the surface as tough membranous flaps and scrolls; this structure remains thin and living during a long time, and it is only at an advanced age, and then only at the base of the trunk, that a liberian lignification ensues of sufficient strength to produce a darkish rhytidome longitudinally chinked and furrowed. The chemical constituents of the bark and wood are well marked and of considerable interest. The starch, which from the beginning of March has remained in copious quantity in the reserve tissues of the stem and branches, begins to dissolve from the bark about one month after the autumn fall of the leaf, i.e., about the end of November, while at the same time in the wood it is only slightly diminished. During the winter also the protoplasm of the rind-medullary rays is specially rich in fat, and a considerable quantity of glucose is also present along with tannin-vesicles at the same time. At all times a white wax, an ill-defined bitter principle (probably an impure or decomposed alcoholic sugar), a large quantity of oxalate of calcium, free phloroglucin (especially in the bast-fibres and medullary rays), and phlobaphene which penetrates the periderm turning it red-brown, may also be found in the tissues of the bark, which in addition contain about 10 per cent. mineral-matters (ash), consisting of about 45 per cent. lime, 15 soda, 5½ magnesia, 21 silica, etc. Large gum-druses appear sometimes in the living parts of the bast as well as in the dead outer portion of the primary cortex, or even enclosed in the periderm. The wood is capable of enclosing a considerable quantity of starch; the vessels and fibres are very rich in glucose in summer, but not in winter; tannin occurs in the medullary rays, in the parenchyma, and the pith; free phloroglucin is found in the parenchyma, and in most of the cells of the pith; the wood has only about 0·28 per cent. ash. The rooting of the tree is powerful, it being composed of

long and strong roots deeply sunk, with no formation of adventitious buds, and therefore of stoles or suckers along the lateral roots, such as are observable in some of the allied species. I have never had the opportunity of investigating the main root or the deeply sunken portions of its structure; but as respects such parts of the creeping roots (though I can hardly call them really 'roots') as I have examined, the following notes, however incomplete, may be acceptable. I have been rather surprised to find in these groundling outgrowths a remarkable development of the fibres both in the bark and the wood, while the vessels are comparatively sparse, thus reversing what is usually the ordinary histological constitution of the true roots. Sometimes I have found the medullary rays very rich in starch; at other times, and when the stem wood had abundant starch, the wood of these creeping organs was almost empty of this carbohydrate; phloroglucin of course is invariably present in copious quantity. The bark, which was free of the tenacious superficial periderm of the stem, or at all events, it is not so well developed there, contains much tannin and its phlobaphene, and a considerable quantity of a bitter principle which has none of the characters of phloridzin. The tree is not exacting as regards the choice of soil, and is frequently seen to prosper where other species languish; but it evidently prefers the clayey and moist soils of plains and hills—a bottom where abundant supplies of lime and magnesia are available, and where manganese and iron can be easily absorbed. The wood is subject to a remarkable malady called *gummosis,* the symptoms of which are an extraordinary formation and accumulation of gum in special reservoirs (lacunæ) hollowed out chiefly in the youngest annual layer as the result of the destruction of some of the living cells which compose it. These cells, which may be regarded as a special tissue, are filled with starch, and enlarge, develop, multiply, and thicken with extraordinary energy; soon the starch is dissolved, the cell-walls disorganise, plates of gum are seen to amass between their successive cellulosic layers, which now unroll and exfoliate and also eventually dissolve, leaving the lacuna (gum-passage) filled with the gum, which, when it happens to be very abundant, sometimes penetrates the bark and appears on the outer surface thereof as semi-transparent amber globules. In this case the tree is stimulated to produce fresh quantities, with the result that its reserves are soon exhausted and it dies. It is evident in any case that the gum is not the outcome of the normal or healthy activity of the

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living tissues. A feverish activity of division, etc., leads to a preliminary disorganisation of the protoplasm of those special cells wherein it occurs. The consequence is an abnormal formation of powerful ferments, which break down and disorganise the pectic substances and the celluloses in their vicinity. In fact, in this tree the process is so powerful and so complete that no trace of cellulose is left as a residuum in the gum itself, and the inclination to form arabinose groups therein is much stronger than that to form galactose groups.

Leaves.—The mesophyll is composed of one layer of palisade cells about four times as long as broad, and a rather loose lacunar tissue irregularly disposed; the lower epidermis has about 240 stomata per square millimetre. This structure indicates only medium capabilities of assimilation and transpiration, and the leaf being thin it absorbs and transmits much heat. On 10th September the relation $\frac{CO_2 \text{ exhaled}}{O_2 \text{ absorbed}}$ was found to be = 0·92, showing only a moderate amount of oxidation. Chlorophyll has been observed in the young spring leaf before any visible starch appeared; but the production of the latter seems well sustained throughout the life of the organ. Carotin is abundant, and so is wax, but there is very little fat-oil. The nitrogenous substances in the fresh leaf vary from about 12·5 per cent. in April to about 0·7 per cent. in October. A copious abundance of glucose or maltose is detectable at times in the conducting tissues of the nerves, while a plate of gum covers the lower wall of the cells of the upper epidermis; oxalate of calcium is very prevalent from an early age. Much rutin is found in the young leaves, and, as the season advances, tannin is formed to the amount of about 10 per cent. in autumn. A very remarkable feature of the organ is that the proportion of mineral matters therein, i.e., in the dry leaf, practically remains the same, viz., about 7·5 per cent. from April till October. The ash (reckoning from spring till autumn) contains 30 to 44 per cent. lime, 7 to 17 magnesia, 32 to 11 potash, 4 to 13 oxide of manganese, and only 1·4 to 2·3 silica. Roundish or reniform fleshy glands are developed on the leaf stalk at the base of the blade and sometimes on the serratures of the blade itself, and freely secrete globules of a transparent thin liquor, which ultimately runs together into a sheet or drop; the maximum volume of this nectar (which consists of a solution of cane-sugar and glucose in varying proportions) always takes place before the leaves attain their full development, and, in proportion as they become completely developed, the emission diminishes and then ceases.

Flower and Fruit.—The epidermis of the corolla consists mostly of oblong cells with sinuous walls, and without papillæ or stomata. The tree flowers abundantly every year towards 1st April in southern parts (1st May in the Lake district). A large quantity of rutin seems to be the most distinctive outcome of the protoplasmic energy, but it does not develop into volatile oil, tannin, or anthocyan, indicating the lightness of the tissues, the feeble development of the conducting apparatus, and a deficiency of oxidation. Askenasy found that the flower buds doubled their weight in the last ten days previous to bursting. The fruiting, which is not constant or sustained even in warm climates, reaches maturity about 15th June. The ovary consists of some 25 to 30 layers; and the ripe fruit (drupe) is composed of (1) an external epidermis (epicarp); (2) a hypodermis of two or three layers; (3) the flesh (mesocarp) formed of two layers, the external one of spheroidal cells, the internal of radially extended parenchymatous cells; and (4) a nucleus (endocarp) divisible into an outer zone of sclerous cells and an inner zone of tangential fibres. The general fact is that the thick cotyledons of the seed contain aleurone and oil, but no starch, and the slightly developed endosperm is of the same nature; the oil amounts to about 23 per cent. of the kernel. The seed also contains amygdalin along with its ferment emulsin, and hence, when bruised and distilled with water, bitter almond oil and prussic acid are obtained. The flesh of the ripe fruit tastes sweet when it contains sugar (mostly cane-sugar, with a little glucose and sorbite), and tastes bitter when the volatile oil, pectin, vegetable acids, and tannin are more predominant; the epicarp is tinged by a red pigment which, with acetate of lead, yields a blue precipitate, and, as Rochleder stated in 1870, 'in all probability it is a decomposition product of the tannin present in the unripe cherry.'

Summary.—It is not very easy to grasp the precise physiological complexion, so to speak, of the Wild Cherry. 'It appears,' says Wigand, 'to possess a great inclination to a partial demise not only of the rind itself, but also of the wood elements.' The remarkable form of lignification attested by the formation of the hornbast, the thickening of the cell wall prior to the production of the gum, the astonishing tenacity and durability of its periderm stand in marked contrast to the strain requisite for extensive seed generation, and to the great activity of its growth up to fifty years of age. The main chemico-physiologic fact is the presence in unusual quantity of two substances, viz., gum and phloroglucin, the former éduced by the disorganisation of products of assimilation, the latter by the decomposition of products of deassimilation.

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NOTES—BOTANY.

Thorne Moor *Violas*.—On Monday, 4th June, I visited Thorne Moor in search of *Violas* (see pp. 155-156, 'The Flora of West Yorkshire'). I found *V. ericetorum* (=*canina*) very common and fine; but did not see a sign of either *V. lactea* or *V. stagnina*.—H. H. CORBETT, Doncaster, 15th June 1900.

***Sagina apetala* at Hooton Pagnell.**—Yesterday (14th June), on the occasion of the excursion of the Doncaster Scientific Society to Hooton Pagnell, I found *Sagina apetala* flowering freely at the base of a wall. Close by, but in a much damper situation, *S. procumbens* was in great abundance, but the two species did not appear to overlap.—H. H. CORBETT, Doncaster, 15th June 1900.

Lincolnshire Aliens.—I have received from Mr. G. Parker, of Grimsby, the following species taken there :—

Saponaria vaccaria.
Centaurea calcitrapa.
Lathyrus angulatus.
Asperugo procumbens.
Bupleurum rotundifolium.

From Messrs. A. Smith and G. Morris, of Grimsby, I have received all the above species except *Asperugo*, and also :—

Senecio sylvaticus.
Asperula arvensis.
Salvia verbenaca.
Caucalis nodosa.
Caucalis latifolia.
Caucalis daucoides.
Kocleria cristata.
Buda neglecta (Kindb.).
Alyssum calycinum.
Bunium flexuosum.
Sisymbrium altissimum.

—E. ADRIAN WOODRUFFE-PEACOCK, Cadney, Brigg, Lincs., 19th June 1900.

***Draba muralis* in Cumberland.**—On the 16th of May this year, when looking over a piece of waste ground in Messrs. Little & Ballantyne's nurseries, Carlisle, where weeds and other garden rubbish are occasionally deposited, I came across a cluster of about a hundred or more plants, which, after careful examination, appeared to me to be *Draba muralis*, but as the recognised habitat of that species is limestone rocks, and as I could not find any record of it for Cumberland, I sent a specimen to Mr. W. Hodgson, A.L.S., Workington. Mr. Hodgson confirmed my diagnosis, but in order to be quite certain he kindly forwarded the specimen to Mr. J. G. Baker, of Kew, for verification. Mr. Baker returned it with a note that 'it is certainly *Draba muralis*, but the proper locality for the plant is limestone cliffs, not rubbish heaps.'

It would be interesting to know if the plant has been previously noted in any other county growing, seemingly, out of its proper sphere. The plants in question were growing practically upon the site of the old Roman wall, along which a public footpath leads from Stanwix to Tarraby. They seemed to be fully satisfied with their position, as they were healthy and luxuriant, being mostly from twelve to fifteen inches in height.—WILLIAM THOMSON, 16, Cavendish Place, Carlisle, 20th May 1900.

NOTE—LEPIDOPTERA.

Appearance of the Co-Migrants *Pyrameis cardui* and *Plusia gamma* at Doncaster.—To-day, while rambling through Wheatley Wood, I noticed several specimens of *Plusia gamma* on the wing. I wondered at the time whether *Pyrameis cardui* had accompanied them. Before reaching home I had the pleasure of seeing the latter species on the high road, settling, as is its habit, on the bare roadway, and then taking a few circular sweeps on the wing, only to return to its original place. Why these two species migrate together is still a mystery.—H. H. CORBETT, 9, Priory Place, Doncaster, 17th June 1900.

Naturalist,

NOTES—MAMMALIA.

Otter in the Wear.—On 3rd, February 1900, an Otter (*Lutra lutra*) was seen in the river Wear, near the confluence of the Gaunless, near to Bishop Auckland.—J. W. FAWCETT, Satley, 1st June 1900.

Otter in the Derwent, Northumberland.—In the last week of May 1900, a young Otter (*Lutra lutra*) about four feet in length, and weighing 17½ lbs., was caught in a rabbit trap on the Shotley Hall estate, by Mr. J. G. Pearson, gamekeeper, who has had the animal preserved and stuffed.—J. W. FAWCETT, Satley, 1st June 1900.

Badger in the County Durham.—A Badger (*Meles meles*) which had been blamed for killing some fowls, was caught alive by dogs, outside a drain by the roadside at West Roddymoor, near Crook, in the fourth week of May 1900. It died, however, from wounds on Saturday, 26th May. It is supposed to have come from the neighbourhood of Hamsterley, in the Wear Valley.—J. W. FAWCETT, Satley, Darlington, 4th June 1900.

NOTE—LEPIDOPTERA.

De-abdominated Insects.—When walking along our country lanes and footpaths I frequently come across specimens of the larger Beetles and Moths that are minus the abdomen. The wings, thorax, and head in most instances are complete, but on occasion some are short of one wing, some of two, but as a rule it is only the soft, fleshy abdomen that is missing. By what bird or animal is this process of de-abdominating done? Is it the handiwork of Bat, Nightjar, Owls, Shrews, or Voles? I have watched most of these vertebrates feeding, but do not call to mind any instance when I saw any part of a capture rejected. I spent last night in watching the Bats hawking over the garden, pond, and field here, but never saw anything let fall by them. I enclose three specimens picked up to-day.—MAX PEACOCK, Ivy House, Bottesford, Doncaster, 19th May 1900.

[Two of the specimens arrived battered to pieces and quite indeterminable, but the third is *Spilosoma lubricipeda*. Will readers give their opinions on the point raised.—ED. NAT.]

NOTE—AMPHIBIA.

Natterjack at Seascale.—Referring to the note by Mr. Farrah, of Harrogate, on the finding of this species by his son at Seascale, and suggesting that the discovery might be a record, this theory must, however, be dropped. In Hutchinson's 'History of Cumberland' (1794) is a list of the county fauna, drawn up by Dr. Heysham, of Carlisle, the ablest Cumbrian naturalist of his day, in which the Natterjack (*Bufo calamita*) is described as not uncommon near the coast-line at Allonby, about thirty miles north of Seascale. Also the late Sir William Jardine reported the occurrence of this reptile in a marsh on the coast of the Solway Firth, in brackish water, and within a hundred yards of spring tide high-water mark. They are, it is added, very abundant for six or seven miles along the coast. Dry spots, however, are its favourite haunts, except at the breeding season, when it visits the water. Writing one day last week to a lady correspondent living at Skinburness, I inquired whether she personally knew anything about the amphibian. Her reply is subjoined:—'If my sister and I are right about the Natterjack, a lighter coloured reptile with a streak down the back, which *walks* instead of *hops*, we have often seen them as far back as we remember.' I have further been assured by another correspondent from the coast-line that Natterjacks are not quite so numerous as they were in the days of his boyhood. Away from the shore, however, the animal is unknown.—WM. HODGSON, Workington, 14th June 1900.

NOTES—ORNITHOLOGY.

Little Auk at Barton-on-Humber.—I recently saw in the collection of Mr. Chas. Couldwell, Hull, a specimen of the Little Auk (*Mergulus alle*), which was caught at Barton-on-Humber, on 22nd March 1900, by Mr. R. Stamp.—J. W. STATHER, 16, Louis Street, Hull, 28th May 1900.

Nidification of Wheatear at Eccup.—I have lately been fortunate in finding a nest of the Wheatear (*Saxicola œnanthe*), a bird which on only one other occasion have I known to nest in this locality, and that nearly twenty years back. Taking a stroll after tea on 21st May 1900, my peregrinations led me along King Lane, Eccup, until overlooking the Wharfedale Valley. In a rough field, the home of Rabbits, I had the good fortune of an acquaintance with this bird by its leaving a burrow, and on inserting my hand about a foot down there was its nest, made of dried grass roots and lined with a little rabbit fur, and containing six eggs; five were of a pale old milk blue, while the sixth was almost white. These birds are to be seen passing along the lanes, flitting from wall to wall, regularly in the spring, but they do not stay.

I have an egg in my collection which was taken from a sandpit near the Bleach Works at Adel, a short distance from the Seven Arches, about twenty years ago.—THOS. RAINE, 4, Woodland View, Woodland Lane, Chapel Allerton, Leeds, 24th June 1900.

The Great Spotted Woodpecker in the North of England.—The Great Spotted Woodpecker (*Dendrocopus major*) seems to be the most common of the three species of Woodpeckers found in this part of Britain. It is a resident in the county of Durham, although numbers come as autumn and winter visitants. These birds arrive in September and October. The following are the records for this county from my 'Birds of Durham' (1890);—'One killed in Brancepeth Park in 1844—W. Procter; one seen in Auckland Park in 1883; one shot at Biddick Hall Farm, Tyne Dock, November 1886; one shot at Harton, November 1886; one shot at Bank House, near the Lawe, South Shields, 7th November 1886. [This bird was very common as an autumn and winter visitant in 1886.] Has nested in Gibside Park—T. Grundy.' Since then I have to make the following additions:—Some [number not stated] were seen on this coast in November 1890; a pair nested within a mile of Bishop Auckland in 1891. It has also bred in Auckland Park, and has been found near Byers Green. One was shot in South Durham in October 1898. [The late] Mr. Hancock in his 'Birds of Northumberland and Durham' (1874), states that there are eight entries of the capture of this species in his journal* between the years 1830 and 1868, but unfortunately he does not give them. He then states that a nest was taken at Swallowship, near Hexham, in June 1868, and speaks of it as the only instance with which he was acquainted of its breeding in the north of England. To this, however, I can add that between the years 1882 and 1889 ten different pairs of these birds reared their young in the neighbourhood of Hexham, of which three pairs nested in May and June of the latter year. Since then it has bred regularly in that district. From my Naturalists' Note-book I gather the following additional records for Northumberland:—A female was shot at Longbenton, near Newcastle, in 1886, and another female on 1st November of the same year at Felton, north of Morpeth. One captured near Newcastle-on-Tyne in October 1889, and another seen near Gosforth in December of the same year. From the same book I find that the Great Spotted Woodpecker bred in the north of Yorkshire (Cleveland) in 1888, and one was shot near Richmond in December 1889. It also bred near Yarm in 1893 and 1894.

*Is this journal extant? Can any reader say? Mr Hancock often refers to his journal and its entries, but does not give details. I, for one, would like to see this journal printed, or, at least, the records it contains. To north of England naturalists they cannot fail to be valuable.—J. W. FAWCETT, Satley, 1st June 1900.

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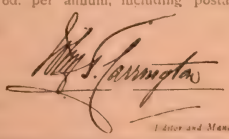

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BOOKS RECEIVED.

U.S. Department of Agriculture.—Bulletin, No. 12, 1900; T. S. Palmer on Legislation for the Protection of Birds, other than Game-birds. [The Department.
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The Irish Naturalist, Vol. 9, No. 7, for July 1900. [The Editors, Dublin.
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Natur und Haus, Jahrgang 8, Heft 18, Juni 1900. [Gustav Schmidt, Berlin.
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Keswick Museum of Natural History.—Catalogue, 1888.
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R. W. Goulding.—Newspaper report of Meeting of L.N.U. at Horncastle—Sheet, 1900. [The Author.
Thomas Sheppard.—Saurian Remains in the Kellaways Rock, Brough, East Yorkshire; and Bibliography for East Yorkshire Geology in 1898; 8vo reprint. [The Author.
Oliver G. Pike.—In Bird-Land with Field-Glass and Camera, 8vo cloth, 1900. [T. Fisher Unwin, Publisher.

IN DEFENCE OF JAMES BOLTON, THE FUNGOLOGIST.

F. ARNOLD LEES, M.R.C.S.,
Leeds; *Author of 'The Flora of West Yorkshire.'*

It is somewhat of a shame to depreciate the genius of this pioneer in field-study, because a few dozen species recorded by him for the Halifax district in Watson's 'History' of 1775 seem very 'unlikely' and are not now to be found within that hilly area. One or two mistakes he is known to have made, but these do not extinguish the presumption of general truth in the plantscape his 'Catalogue' preserves for us.

There are many indirect proofs—too strong, combined, to leave us in any doubt—that he was the author of that catalogue, which was full of graphicalities in that quaint style afterwards elaborated in the 'Filices Britannicæ' of 1785 and the 'History of Halifax Fungusses' of 1788-91. Watson the historian was not a botanist at all, to begin with; Bolton lived at Halifax in the years preceding and following, and there were only three or four notable men of like scientific attainments in the N. of England, these being well known to one another, and one of whom is said to have pointed out Bolton's error in the matter of *Colchicum*.

As witness at once of how species disappear, and how fallacious are arguments alleging error in designation because of disappearance; I may here quote what Robert Teesdale says in Vol. 2 of 'Linnean Transactions' (1792) of *Viscum album*, the Mistletoe—'It is very common in the West Riding of Yorkshire, but is hardly to be met with in the North and East Ridings.' Very common! Does anyone fancy Teesdale was flagrantly exaggerating a frequency or an infrequency? Is it common now? No—essentially it is one of the lost species, which were widespread and in some plenty a hundred years ago: which have been as certainly driven from the fort they held by the slow breach of hardening climatic conditions; one of the changes, insidious and avert from our vision, which were and are altering for us the face of Nature.

But does the categorical amplitude of detail, the fioriture with which he describes plants and their stations, prove nothing? Surely he cannot have invented that wealth of description? Yet either that—in which case he was a botanic romancist—or he wrote of what he saw. Any errors to be explained by the mislead of the Text-Books he used, I would admit: nothing beyond. He did too much exact work later; and let me add that *not one half* of the Fungi he found at Halifax and

described with such precision *grow now* where he got the specimens his plates were drawn from. A hundred years makes a sad hack-up of any locality list: more of lower forms than higher because the conditions they exist under change and alternate more rapidly. Nay, chapter and verse are given too rigidly—they bear the impress of truth in how they enthused him at the discovering—for me to doubt. Let me quote one example only: (p. 729 of Cat. in Hist.) *Hippuris* . . . . . 'It is to be found in a piece of very unsound land near Mixenden-mill, and also in Norland, about the edge of Old-house Mill-dam. The flower of this beautiful plant is, perhaps, the most simple in all nature, having neither calix nor petal, but consists of only one stamen and one pistil followed by a single seed.'

Can anybody in his senses doubt that Bolton found this, or—worse still—think he described it (so *con amore*!) from Hudson's 'Flora' without finding it? The supposition is monstrous. The phrase, 'unsound land,' the mills (there yet) named, one of the particulars the result of his own observation, not to be gathered from Hudson, all to my mind leave no halfway house between absolute belief that it grew there in 1774; or that his memory is not one to be revered! And all Bolton's records are of 'a piece,' as Yorkshire clothiers say; they are warped and wefted with internal evidence of their general reliability.

As to Bolton's authorship: we have (I think) not his own admission of an 'open secret' among savans of the time; but the manuscript was seen by my late friend the Rev. W. W. Newbould, and he said it was in Bolton's old style hand, and agreed with notes, etc., to the Original Drawings of the 'History of Ferns,' Pts. i. and ii., now in the Botanical Department of the British Museum. Furthermore the Cat. of 1775 includes *Blasia*, and hundreds of Musci, Lichens and Fungi (*Hydnum imbricatum*, notably—'I found this in North Dean in Greetland in pretty great plenty'—the stations and remarks on which are repeated word for word in the amplified 'Fungusses,' showing that Bolton was a student of some attainment (for that day) in Fungology, thirteen years before his 'History' was issued), and that oft repeated personal pronoun, 'I,' 'I,' 'I,' clinches the argument in favour of Bolton being the compiler for Watson of the History's Catalogue.

I could go on—and give Teesdale's contemporary testimony of 1798, '*Plantæ Eboracenses*'; and likewise the quotations in the 2nd Edn. of Hudson's 'Flora Anglica,' where in 1778, 'Bolton' is credited in that '*prope* Halifax' with the record for *Campanula hederacea* which first appeared in 1775—three years earlier—on p. 732 of this wrongfully assailed Catalogue.

NOTES—LEPIDOPTERA.

***Limenitis sibilla* at Langton, Horncastle.**—I have to record that a White Admiral Butterfly was taken in my churchyard on Wednesday, the 11th July inst., by a friend of mine. It escaped from him again, but he had sufficient time to examine it, and is himself an authority, having a large collection.—J. CONWAY WALTER, Langton Rectory, Horncastle, 23rd July 1900.

Red Admirals and Death's Head Moth at West Ayton.—The seasons seem to be curiously out of joint. From 15th to 24th June I have had many Red Admiral Butterflies (*Vanessa atalanta*) in the garden, and yesterday, 25th June, a man brought me a fine Death's Head Moth (*Acherontia atropos*) taken here, and apparently very freshly emerged.—W. C. HEY, West Ayton, 27th June 1900.

Lime-Hawkmoth at Cottingham.—Mr. H. Vickers, of Beverley, obtained from the roots of a lime tree at Cottingham a pupa of a Hawk-moth which he reserved for me. Unfortunately, during his absence from home, the moth had emerged and escaped, but, on seeing the pupa-case, I at once pronounced it to be one of *Smerinthus tiliæ*. According to Barrett's 'British Lepidoptera,' there is only one record of the occurrence of this species in Yorkshire.—J. R. LOWTHER, Crane Hill, Beckside, Beverley, 9th July 1900.

***Argynnis euphrosyne* near Kendal.**—I know not whether the fact be worth record, being now a very 'rusty' entomologist, but, botanising in Park Spring and Cunswick Wood, two miles N.W. of Kendal, on 28th May last, my eyes were delighted by the large number of brilliantly-tigerine just-emerged Argynnidæ flying in the sun and settling with expanded wings on the violet leaves. I had no net, but the species was about two inches in expanse of wing, and had only one silvery spot on the tawny underside.—F. A. LEES, Leeds, 11th June 1900.

NOTES—FISHES.

Unusual Coloration of Flounder.—Whilst fishing in the river Hull, near Beverley Lock, on the 6th of June, I caught a Flounder (*Pleuronectes flesus*) the under-side of which was exactly the same colour as the upper-side generally is. I have never seen such a variety before, but Mr. T. Skinner, a local angler, tells me he caught one last year which was white on both sides.—J. R. LOWTHER, Crane Hill, Beckside, Beverley, 9th July 1900.

Eel-Skins in Lincolnshire Folk-Medicine.—I enclose herewith a thong of eel-skin used as a garter. The skin of eels is used to keep off attacks of ague, rheumatism, and sciatica. Its use is now nearly given up, but a generation or two ago our fen-men mostly gartered their long worsted stockings with such thongs. One old man we knew used to wear plaited bands of like stuff round his wrists. Fine-cut strips were used as thread to sew on breeches and overcoat buttons. This practice is also obsolescent, if not altogether abandoned by our local tailors. The custom died when the doe and buckskin breeches went out of fashion.—MAX PEACOCK, The Manor, Bottesford, 12th July 1900.

Sturgeon in the Trent at Althorpe.—On Monday, 16th July, a Sturgeon (*Acipensor sturio*), or, as our local folk call it, 'Stogun,' was found in the river Trent at Althorpe, Lincolnshire (Div. 1). It seemed to have been killed by the screw or paddles of a steamboat. Length 7 ft. 3 in., weight 9 st. These fish seldom come up our river, but on occasion they get into our warping drains. The officials of the Crown claim them as a rule, but in several cases they belong absolutely to the lord of the manor. This fish was quite fresh, and was at once claimed by the Customs authorities, who had it buried.—MAX PEACOCK, The Manor, Bottesford, Lincolnshire, 23rd July 1900.

NOTES—ORNITHOLOGY.

Merlin Shot near Leeds.—On 29th May, while looking for a Cuckoo's egg in nest of Meadow Pipit on a moor at Adel, where I have found several eggs and young in years past, I came across a gamekeeper who during conversation told me that less than a month ago he shot a Merlin (*Falco æsalon*) on Blackmoor, Moortown. This is a very likely place for this bird to breed, and I am sorry its career was cut short, as no doubt that was what the bird intended. He had a nest of Sparrow Hawks (*Accipiter nisus*) under his eye near at hand and intends to shoot all very shortly. Poor birds!—THOS. RAINE, 4, Woodland View, Woodland Lane, Chapel Allerton, Leeds, 6th July 1900.

[Pity the gamekeeper, or his employer, cannot be brought to book for such wanton slaughter!—EDS. Nat.].

Curious Nesting-places near Brigg.—Our birds as a rule generally pick somewhat the same sort of nesting-place, but I have come across several that were in most unlikely spots. The Stockdove, Robin, and Mallard, also the Red-legged Partridge, often pitch upon very curious sites. In 1878 a Mallard (*Anas boschas*) built on the very top of a bean stack. She laid eleven eggs and reared ten young ducks. Her mode of landing her young down to the drain hard by is not known. In 1893 a Mallard had her nest in that of a Rook in the rookery at Bottesford Moors. She brought off six young ones and also got them down to the drain unobserved. In 1879 a Pheasant (*Phasianus colchicus*) laid her 'louter' of eggs in a disused Sparrow Hawk (*Accipiter nisus*)'s nest in Holme Plantation, North-West Lincolnshire. Robins (*Erithacus rubecula*) I have found building in old boots, old tin cans, a broken pitcher, a disused pump spout, an old Swallow's nest in a cow-house, in trees, banks, ivy, trellis-work, in fact the Robin takes up any position, but it never builds far away from the haunts of man. The Stockdove (*Columba œnas*) is also a bird of many sites for nesting spots. Rabbit holes, holes in trees, on the flat between the branches of pollarded trees, in ivy, holes in walls, disused hawk's and owl's nests, and on the ground under the shade of thick furze bushes. The Red-legged Partridge (*Caccabis rufa*) as a rule takes a site like the English bird, but on occasion it takes to other locales. The top of a stack, on the side of the roof of a thatched cottage, in a pollard willow, on the top of an ivy-covered wall, in a rabbit-hole on the side of the cliff of Yaddlethorpe gravel-pit—about a foot in, in a hamper where hens were daily laying (in the garden at Bottesford Manor), and, lastly, in the corner of a disused pigstye close to a cottage door. The Swallow (*Hirundo rustica*) also takes curious places at times. I have known one build under the branch of a dead ash tree. At Cadney, near Brigg, they build under the arches that carry the roads across the carr drains. In these cases the nest is only a foot and a half to two feet above the water. At Messingham, North-West Lincolnshire, a Swallow built its nest under the pommel of a saddle that hung in a horse stable. The owner would not have it molested, although he frequently wanted it. In Lincolnshire ill-luck follows the wilful disturbing of a Swallow's nest. The Great Tit (*Parus major*) and Blue Tit (*P. cæruleus*) also pick on funny places for nesting. Pump barrels, the skull of a horse, the slit of a letter box, and the ventilator to a stable have all been used to my knowledge by the Blue Tit. The Great Tit is partial to a pump that is in use. Our garden at Bottesford used to yearly furnish two examples of this, and the field at the back of the house one. Pumping might destroy the nest somewhat at first, but the birds always overcame the difficulty and reared at least one brood of young each season. Rooks (*Corvus frugilegus*), too, sometimes choose curious sites for building. At one time I knew a small larch plantation of quite young growth that the rooks had taken a fancy to. There you could walk by and look into the nests as you did so without any trouble. Plenty of large trees were in the neighbourhood, but these larches were chosen and used. These trees are now grown up, but the rooks still stick to them.—MAX PEACOCK, The Manor, Bottesford, Lincolnshire, 4th July 1900.

THE VOLTEFACE OF FLORA: A REJOINDER.

F. ARNOLD LEES, M.R.C.S., L.R.C.P.Lond.,
Leeds; Author of 'The Flora of West Yorkshire.'

Three of the personal remarks in Mr. Moss's well-arranged paper on 'Changes in the Halifax Flora' call for a reply from me; although 'controversy' over a tentative theory yet in the adolescence of demonstration is as far from my liking as the imputative decoy set for me on page 169 of the June 'Naturalist.'

No! I do not wish to advance any such theory of substitution applicable to a secluded clough, as Mr. Moss implies to be likely by his aggressive 'If'; nay, I consider his analytic particulars in this case to have forged a sound chain of reasoning. To have substitution (even the most gradual) there must be some patent—or more often hidden—change of environment. Mr. Moss's facts predicate little if any; therefore he is probably right in considering that the compiler of the list in Watson's History meant *crocata* by his fistulous *Œnanthe*. Not quite certainly, for the lowland open-marsh *fistulosa* has got less common, has been extirpated by deep drainage in Yorkshire stations wherein it flourished to my knowledge in the Seventies. Per contra, to my knowledge and judging from old Herbaria, *Œ. crocata*, with *Typha* and other things, has grown vastly more abundant (if not absolutely originated) at Adel, near Leeds, since the making of the dam there, and in the last ten years since it has fallen quite out of use and is growing up, this same *Œnanthe* is being choked out: to show itself at intervals miles lower down the Adel-Meanwood beck where barish flood-mud banks allow of rejuvenescence. Mr. Moss attributes some aquatics to man's handiwork: why not this? It requires much water for its tubers to ripen, it is transported readily by waterways, it will flourish in shade or the open, but it cannot stand drought or vigorous competition: *Typha latifolia*, planted amongst it, comes out victor in a very few years.

My contention is, merely (and broadly), that as conditions alter so, slowly, does the flora of a tract undergo a concurrent variation? To assert the contrary is to subvert almost everything we know as to the limitations of soil, altitude, temperature under which species flourish. Some have a strict range, others a more elastic. Why do we never find the Cloudberry below 1200 feet, or brought down and growing by the Calder side? or *Trientalis* in same case? Because such spate-removal would

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kill the individual root so brought down, whilst cool and safe among the roots of heather on the bleak moorland ridge, the delicate wiry runners of both are killed neither by smoke nor fire. But let some physiographic change turn the table land or slope whereon they grow into a water-logged condition, and the season thereafter nor *Rubus* nor *Trientalis* comes up there again amid the bog moss or the moss-crop that begin to appear. If this is not a true picture eyes have misled us older botanists, and experience counts for naught.

It is to the point, too, to mark that railway banks in the Halifax district, now for many years have been clothed with *Hieracium boreale* where, within the memory of many few grew —I say not, none—intermingled with the Wood-Sage, Ling, Bilberry, *Holcus mollis* of the banks before the cuttings were carved out and sloped. Now, year after year—for their end is not yet, their requirements prevailing—these strong, late-evolved weeds usurp in serried array the barren pitch little else can live upon. It is very different with the rail-banks of (say) Berkshire or Lincolnshire; although that is another question. The point is, that the even-graded banks are not natural, but kept up by culvert or stone-sluice drainage year after year in practically the same condition. The same with the masonry of a reservoir or canal: the species, be they tender, strong, or like *Linaria Cymbalaria* from Italy, or *Potentilla Norvegica* from Scania, which once get a footing keep it without much alteration for a considerable period. Yet, even here, there will come a time (with species not truly indigenous) when from some attenuation of virility or constitution, the existing plants grow less semiferous, an impotence comes upon pollen-tube, or some sterility upon stigma; and then they commence to go back—to disappear. This has been so with the American water-weed; and is so with the *Potentilla* of the Aire and Calder Canal. Freshly gathered seeds from Stanley, fifteen and nine years ago, germinated promptly enough; some tried the last two years have 'failed' (though ripe enough), and at Armley locks this year the plant is hardly to be seen.

Another aspect of the volteface Flora presents us with as part of her grand stage spectacle: Mr. Moss surely does not contend that, where trippers or what-not exterminate certain plants, no others of different kinds clothe the ground the earlier grew upon! If earth on Beacon Hill-top were enclosed as a garden it would ultimately produce Groundsel or small *Veronica* or other weeds not there before, whatever its ill-

success for vegetables: if a bigger acreage were fielded, Cleats, Docks, and Thistles would soon be in evidence where none were apparent before.

Again, 'it *is* significant that practically' the rarities mentioned by Mr. Moss—*Trientalis*, the *Cloudberry*, *Genista anglica*—have withstood the ravage of Time and Circumstances: only the real significance has been missed. They *have* withstood 'the smoke, the firing of the moors'—two dummy enemies set up to witness against my Truism of Change! I don't wish to overset them, for they are harmless enough to our lovely moor-top wildings; smoke on Swill hill diluted with a world of fresh air must be a very minus quantity and an ineffective figment at 1,200 feet above the sea where the Cloudberry lives; and as for the fire! why, we have abundant evidence it kills out very little either. The sparsely-distributed, widely-spread underground stems of *Trientalis* and *R. Chamæmorus* are safe as the Ling and Petty Whin; after the scorcher has passed, destroying the above ground growth, and this generally in the season when the moor is least likely to be materially injured, everybody knows how the perennials shoot up afresh.

Mr. Moss seems to me to shut his eyes to changes in plant site (sometimes, if he will look, he will find explainable changes over only a few yards in distance); denying the many, because a certain few forms, in undisturbed positions, under conditions of comparatively little variation, have lived on for a hundred years. As many such go not against my theory, I could, an I willed, adduce several survivals even more striking than the Cloudberry and the Wintergreen. Those particular species cannot have been incommoded, for to certain detriments they are most sensitive. Hard to grow in a tree-pot or a rockery, they are quickly destroyed by enclosure and disturbance or exposure of their roots. The Cloudberry has been grown from seed in the Edinburgh Botanic Garden; but would not fruit there.

Twenty-five years back another *Genista* grew on Wibsey Slack, not 300 yards outside Low Moor railway station: the ground now is a bare 'park,' yet, not being a very pretty or conspicuous Whin, I do not think hand-raids went with it. It died a natural death from several natural causes combined.

So I cannot think a few selected examples of fixity of station at all 'goes dead against' my interpretation of the '*natural changes which species undergo in a given area.*' That is sheer nonsense language. We must have a decent precision in terms.

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I never said '*species*' underwent any 'natural change' at all! Or un-natural for that matter; though a better word than 'natural' might, perhaps, be found. I meant a change non-intentional rather on the part of the initiator. The species themselves do not alter in constitution;—natives at any rate don't, the Daisy of to-day as strong, I take it, as the Daisy of Malory's day;—and their requirements are a fixed quantity, too. All sorts of changes, independent of man, interfere with a plant's longevity; but what I advanced was, that where they did not die out altogether, the exact locations of plants varied with changing conditions, and that their former sites were occupied by other species, by no means always Aliens; and that, over large areas, as one spot grew drier and another wetter, or shadier, there were many singular dis- and re-appearances. This is the expression of a fact that stares every field botanist in the face whose outlook is upkept for a decade or two. Many plants besides Lilies and Orchises are locomotive; wind (with Epilobium seed especially)—birds (with Cloudberry and other fruit grains) play a great not-yet-half acknowledged part in keeping up the sum-total of our flora to its norm.

To me the continuance of *Pyrola* at North Dean, etc., is the least explainable of Mr. Moss's facts. I suspect the landslip slope on which it grows to be protected in some way from further dislocation or interference. There was a certain inaccessibility years ago, and an unsuitability for the encroachments of industry: hill had said to intellect (as it were) 'Thus far, and no further.' Plants that grow in shadow are not very sensitive to smoke, they dormate long, show their green late like the ash, and their vulnerable period of shooting into blossom is short. The tenacity of life in *Pyrola* rootlets is amazing. Give them a well-drained tree-pot, kept atilt, as much transplantation as you like, but no water-famine or sun-ray, and they thrive apace. I have *Pyrola media* now, flowering nicely, in a slanted pot on a busy roadside rockery in this smoky town of Leeds. I have had both it and *Campanula hederacea* some years. The ivy-leaved bell-flower (from Marsden), however, will only blossom under a bell glass. Smoke chokes that; which shows the smoke fiend *not* to be rampant in Cob Clough, at any rate.

I don't think Bolton 'overlooked' *Epilobium roseum*: it has grown vastly commoner the last forty years, spreading principally through the medium of market gardens and soil at the roots of florists' plants. King, or one of his successors, is likely enough

answerable. I recollect the time when it was practically unknown in the suburbs of Leeds, now it is occasional in them, in neglected corners of shrubberies, among Raspberry canes, and Rhubarb beds. It spreads by its light feathered seeds; a solitary one season, left to seed and the next year it will be detectable, on bare spots between a crop, by the dozen within a few hundred yards!

When I wrote that the natural stay of species in an area may be 'long or short,' I certainly did not intend the latter adjective to convey any period much under 25 years. A year or two back (I have not access to the numbers) in the 'Journal of Botany' I adduced such 'positive evidence' as Mr. Moss in concluding his article calls for. I repeat one case, ever fresh in my mind. In 1876-8 Linwood warren, in mid Lincoln (near Rasen, where I then resided) was a wet peaty tract, water-logged sand on Kimmeridge clay, and it produced several rare Sedges, *Lycopodium inundatum, Breutelia arcuata*, etc. I left the district. Examined again in the late Eighties, some water-cuts had been made and many seedling firs had encroached on the moor, and were growing with *Serratula* and *Vicia Cracca* where none of the trio grew, or could have grown, before. Again, at my last visit in 1896 or 1897, the ground was for the most part well-bushed, heather and ling clad, and produced hundreds of fine plants in full flower of *Gentiana Pneumonanthe*. I daresay some draining had been effected by Colonel Conway Gordon, and some spruces planted for cover, but the old bog had vanished, grown drier from blown sand off the adjacent Hamilton hill, the flora had changed completely, and not wholly or in larger part by consequence of unnatural interference. I repeat, in a greater or less degree, slowly or rapidly, this sort of change may be observed all over our country; least conspicuously, of course, on elevated, remote moorlands, and far-from-railway woods.

It is not a fair test of the truth of this general Proposition, to pick out a few cases of species that have persisted (though admittedly diminishing) over long years within the ring-line of one peculiarly extensive parish, and claim they quash a definition of what in some degree comes under every botanist's notice. In such a parish there is little room for change of actual site in the species that prevail. On the moors alone is the hand of man idle, the ground there is already occupied by millions of well-rooted Callunas and Vacciniums, whose acres of growth are not rudely-enough riven and displaced by lightning, rain

storm or other cataclysm of nature so as to lay bare for a bit under new conditions some ground for the life lying in the soil. But . . . . trees once covered these hills, we know! And in our day it sufficeth to say that the springy carpet of wiry perennial growth that lies over so much of its higher plateaux, protects the ground from assault, ay! prevents—puts off, that change in the flora which under altered conditions must ensue. To me no verity is more certain than this.

I am, of course, not unaware how very long and strangely some plants will prevail; the flora of a large area, like Scotland, or Ireland, has not in two hundred and fifty years *lost entirely* above a dozen species, and those mainly of sea-coasts; yet in other areas a twentieth the size, notably Lincolnshire and Lancashire, the change and substitution concurring with alterations in the character of big districts, is well marked: it extends to as many as twenty former incoles now quite extinct; and this is well known to those field observers whose practical acquaintance extends over even a quarter of a century. I am a little concerned at the quarter from which opponent criticism of my truism of 'Change' is coming. I fancy I tipped some of the arrows myself in epistolary communications written *currente calamo,* and giving, along with asked-for information, spur-of-the-moment views of this Halifax 'species' or that, too hastily formed. My conclusions have not remained rigid and fixed since 1895. The many recent facts I could adduce from my note-books I had fancied only bore out the observation of most of our older-hand botanists. And the researches of Mr. Clement Reid into the fossil seeds of the late-glacial deposits bear out my thesis, and prove incontestibly that over wide tracts many plants 'Were,' which in the same locations, now, 'Are Not.'

To draw to an end, on the whole Mr. Moss's views and mine are fairly in agreement. I can endorse his able summary on p. 171-2, when he admits that physiographic factors *are* 'operative.' If at all, who can limit the effect of successive applications of the helm—the physical cause, on the course vegetation takes afterwards? In affairs floral is there no tacking, no water-leak, no drifting shoreward, never any foundering? Leaving metaphor, I admit that introduction of 'fresh types' *is* exceptional; but much more exceptional in a rugged, moory, elevated area like Halifax than in one such as that about Reading or Kidderminster; where new items in the flora have replaced old ones by scores—*Diplotaxis* instead of *Hieracium,* by millions on the embankments. To revert to the particular, again,

for a moment; of old types *Pyrola minor* loves above all things a bare, steep, soppy site, for where soil has slipped competition (in the shade) is nigh nil at first. But in time, and I bear in mind several particular instances, it gets ousted from its shelf, and just there is known no more. Yet, years later, if another slip occurs, or a storm uproots some neighbour tree, it may appear, only a few paces away or a hundred yards from the original site. God alone knows how many seeds or potentials of life are in the soil of the woodland everywhere awaitant on their resurrection! Of 'new' types—though Mr. Moss would have it an old one miscalled—let us focus our attention on the *Œnanthe crocata*, now in several of the cloughs and by the river, always at lower levels than the reservoirs at their head. Do we find it by the feeders of the dams on the open moor? No. Do we always find it in suspicious stations where man might have (very foolishly, for it is a virulent poison to cattle) introduced it? No, again.

Then what is there against its being an 'old inhabitant,' a survivor? Only that Bolton mentions not such a fine striking plant, whereas he took note of an inconspicuous *Mœnchia*? Again, hardly that, but that a marked substitution of one set of species for another set is not without parallel, given twenty years and a radical degeneration or amelioration of the physical environment. I call up a twice-seen picture: a marsh at a clough's mouth in 1880 (say) produces *Stellaria aquatica, Galium palustre* and *Witheringii, Epipactis palustris, Anagallis tenella, Parnassia, Ranunculus Flammula, Veronica Anagallis,* and *Œnanthe fistulosa*. Owing to the growth of trees—alders, willows, birches—the construction of a reservoir up the gorge, the ground consolidates, the marsh dries up, the stream runs intermittently straight through the outfall flat, and in twenty years hardly one of the above could or would live on in the resulting thicket. *Equisetum hyemale*, if there at first (but it wasn't), might: but in their place last year might be found *Stellaria nemorum, Crepis paludosa, Veronica scutellata, Galium uliginosum, Lotus major,* and *Œnanthe crocata*! Perhaps even *Solidago*. If that change was possible in one York dale, why not in another?

The special likes and requirements of *Œ. crocata* have been already stated, but I would repeat what I said in 1895 regarding the apparent strangeness of a lowland hydrophile like *Œ. fistulosa* growing by Ripponden brook, or in Warley Clough, or lower about Sowerby; where now, says Mr. Moss, only

Œ. crocata occurs. Well, it does look a staggering change! Yet the changes in climate, air, 'cover,' since Bolton's day—in (say) a century—have been vast. I know of no reason why *Œ. fistulosa* should not have grown 'at home,' in the marshy pastures and alluvial flats of the clough embouchures, before the pollution factories indirectly entail spread around their vicinities. Like *Hippuris, Œ. fistulosa* is of cleanly requirements, and not robust habit. Enrichment by manure of a field where it grows will always easily kill it. *Mœnchia erecta* and *Trifolium subterraneum*, such *now* apparently impossible growths, might really very well have grown on the dry, sandy, and gravelly edges about Skircoat and Warley. I profoundly believe they did, and that Bolton was nothing like such a blunderer even in his maiden effort as very learned gentlemen of to-day would have us consider. Thirty years' observation and field work have removed very many of the cocksure notions with which the writer's youth was decorated. Bolton, too, used in his novitiate that itself inaccurate or at least skeleton Manual, the *Flora Anglica* of Hudson. Still, after all the years we revert to *Ficaria verna*; and in like fashion Bolton's star will rise again. In his phytographic picture of Halifax as it was he limned what, apparently, successors are not content to leave unsmudged: let them rather, I would advise, sketch painstakingly and as artistically as they can consistent with truth, such a phytograph of the parish To-day as shall be a worthy companion and contrast to the first, leaving such criticism as must be largely suppositous severely alone. So only shall the verdict of an interested Posterity be favourable.

In conclusion, the one aquatic type of plant which can least bear contamination of the water is *Hippuris*. And, while water weeds have increased on Mr. Moss's own testimony, this *Hippuris* is almost the only one that has vanished. In brief, my critic appears to quarrel with the Deduction whilst furnishing overwhelming witnesses to the facts leading to it.

NOTE—FLOWERING PLANTS.

***Draba muralis* near Huddersfield.**—Last month (Naturalist, July 1900, p. 222) Mr. W. Thompson records this species from a nursery waste-heap in Carlisle, and asks if it has been previously noted in any other county away from its natural habitat.

In a nursery at Dalton, near Huddersfield, known as Ponty's Gardens, this plant grew well for many years. The gardens are now abandoned and the plant destroyed during recent alterations. In the same grounds *Corydalis bulbosa* occurred, introduced with rhododendrons.—T. W. Woodhead, Huddersfield, 23rd July 1900.

YORKSHIRE BRYOLOGICAL COMMITTEE: REPORT FOR 1899.

J. J. MARSHALL,
Beverley; Hon. Secretary, Yorkshire Bryological Committee.

A MEETING of the Yorkshire Bryological Committee—one of the Committees of Research of the Yorkshire Naturalists' Union—was held at York, on the 5th of October, and the following report was drawn up of the work done by the various members.

The extreme dryness of the summer was prejudicial to the growth of Mosses and Hepaticæ in the lowlands, as well as on the hills, during the present year. The drought prevailed during an abnormally long period, and much affected the proper growth of these moisture-loving plants.

Notwithstanding this extraordinary summer season, some very interesting mosses and hepatics have been found.

Mr. William Ingham, B.A., of York, has found the following species and varieties during the year:—

Sphagnum cuspidatum Ehr.

VARS. ***plumosum*** Nees and ***serrulatum*** Schleich. At Wearhead, Durham.

VAR. ***Torreyi*** (Sull.) Braithw. On the Hambleton Hills, Kilburn. Dr. Braithwaite says this is the second locality in Britain for this variety.

Pleuridium axillare (Dicks.) Lindb.

VAR. ***strictum*** Dicks. At Terrington, during the Y.N.U. excursion. This has not hitherto been found outside Scotland.

Seligeria calcarea (Dicks.) B.&S. and

Seligeria paucifolia (Dicks.) Carruth. Both in Danes' Dyke, Flamborough, a new locality for these species, by Messrs. W. Ingham and J. J. Marshall.

Dichodontium pellucidum (L.) Schpr.

VARS. ***compactum*** Schpr. and ***fagimontanum*** Brid. Both by a stream at Wearhead, Durham.

Tortula mutica Ldb. By the River Foss, York.

Mollia crispula (Bruch) Lindb. In the Jackdaw Crag Quarry, Tadcaster, 21st January 1898; a new moss for Yorkshire, verified by Dr. Braithwaite.

Mollia æruginosa (Sw.) Lindb.

VAR. ***intermedia*** Jack. By a stream at Wearhead, Durham; verified by Dr. Braithwaite.

1900 August 1.

Leersia laciniata Hedw. (***Encalypta*** Auct.). In good fruit at Wearhead.

Orthotrichum pulchellum Brunt. At Danes' Dyke, by Messrs. Ingham and Marshall.

Bryum pallescens Schleich. In nice fruit at Wearhead.

Bryum Mildeanum Juratz. On Falcon Clints.

Fontinalis antipyretica (Dill.) L.

VAR. ***gigantea*** Sull. In a stream at Saxton; a new moss for Yorkshire.

Amblystegium Kochii Br.& Sch. Driffield, at the Y.N.U. excursion; both the large typical form and a small form, each verified by Mr. Dixon.

Amblystegium filicinum (L.) DeNot.

VAR. ***gracilescens*** Schp. At Wearhead, Durham.

VAR. ***elatum*** Schpr. At Wearhead, Durham.

Amblystegium Juratzkæ Schpr. Lastingham, with the leaves very squarrose and capsules very long.

Amblystegium exannulatum (Gumb.) DeNot.

VAR. ***purpurascens*** Schpr. On the hills over Langdon Beck, Durham.

Amblystegium revolvens (Sw.) DeNot.

VAR. ***Cossoni*** Ren. Driffield, during the Y.N.U. excursion.

Amblystegium falcatum (Brid.) DeNot.

VAR. ***gracilescens*** Schpr. High Force.

Isothecium viviparum (Nees) Lindb. (***Myurum*** Auct.).

VAR. ***cavernarum*** Mol. Near the Kirkdale Cave.

Plagiothecium denticulatum (L.) Br.& S.

VAR. ***majus*** Boul. At Tockwith.

VAR. ***densum*** Schpr. At Kilburn.

Isopterygium depressum (Mitt.) Bruch. Near Kirkdale Cave.

Brachythecium rivulare Bruch.

VAR. ***latifolium*** Husnot. At Wearhead, Durham.

Hypnum speciosum Brid. Ackworth.

Hypnum murale Hedw.

VAR. ***julaceum*** Schpr. Near Kirkdale Cave.

Leskea polycarpa Ehrh.

VAR. ***tenella*** Br.& Schpr. Arncliff Wood.

Ctenidium molluscum (Hedw.) Mitt.

VAR. ***fastigiatum*** Bosw. On the Hambleton Hills.

Reboulia hemisphærica Raddi.

VAR. ***chlorocarpa.*** Jackdaw Crag quarry, Tadcaster, Y.N.U. excursion.

Preissia commutata Nees. Coatham Marshes and Falcon Clints.

Mœrckia hibernica (Hook.) Gottsche. Coatham Marshes, a new locality for this rare hepatic.

Fossombronia Dumortieri Lindb. Near the River Foss, York, and on Skipwith Common.

Aneura sinuata (Dicks.) Dum., c.fr. Strensall Common.

Mr. J. J. Marshall, of Beverley, reports having found the following:—

Mollia verticillata (L.) Lindb. Goodmanham.

Mollia crispula (Bruch) Lindb. Danes' Dyke; found by Mr. W. Ingham and himself.

Hypnum pallidirostre A. Braun. Beverley Westwood.

Mr. James Needham and Mr. C. P. Hobkirk, F.L.S., report ***Hypnum (Amblystegium) ochraceum*** Turner, the former from Hebden Bridge, and the latter from Ilkley Moor.

Mr. M. B. Slater, F.L.S., reports that his MS. list of the 'Mosses and Hepatics of North Yorkshire' is now about completed, and is in the hands of Mr. J. G. Baker, F.R.S.; it is therefore hoped that the next part of the 'Transactions' (being a continuation of the second edition of Mr. Baker's 'North Yorkshire') may soon be printed, and issued to the members of the Union. This list will contain the names and localities of all the mosses and hepatics that have been observed up to the present date.

NOTES—HYMENOPTERA.

Hymenoptera taken at Bottesford, Lincolnshire.—The following species have been taken by me on or about 21st May 1900, and named by the Rev. A. Thornley:—*Bombus agrorum* (♀), *Tenthredo livida*, *Cephus pygmæus*.—MAX PEACOCK, Bottesford, 12th July 1900.

Lincolnshire Tenthredinidæ.—The following species have recently been taken:—

Pachyprotasis rapæ. Linwood, June 1900 (Peacock).
Macrophya ribis. Cadney, 1899 (Peacock).
Tenthredo livida. ♂, Gainsborough, 14th June 1900 (Thornley).
Tenthredo moniliata var. *lachlaniana.* ♀, Linwood, June 1900 (Peacock).
Pœcilosoma tridens. One ♀, Linwood, June 1900 (Peacock).
—ALFRED THORNLEY, South Leverton, 12th July 1900.

NOTES—ORNITHOLOGY.

Stone Curlew in South Durham.—A pair of Stone Curlews (*Œdicnemus œdicnemus*) were shot on the north side of the mouth of the Tees in August 1897. This bird is only a casual visitant to the county of Durham. —J. W. FAWCETT, Satley, Darlington, 1st June 1900.

Pied Bunting and Sparrow near Horncastle.—We have recently caught near here a pied Bunting (*Emberiza miliaria*) and a white House Sparrow (*Passer domesticus*), with bars across each wing as black as the feathers of a blackbird.—J. CONWAY WALTER, Langton Rectory, Horncastle, 23rd July 1900.

Quails Nesting at Bottesford.—A pair of Quails (*Coturnix coturnix*) have nested on some light sand land in the Bottesford district (Div. 2). I am sorry to say the mowing operations now in full swing have destroyed the nest.—MAX PEACOCK, The Manor, Bottesford, Lincolnshire, 2nd July 1900.

Strange Place for a Stock-Dove's Nest.—Last Monday (12th June), while looking for plants in an old disused quarry at Pickburn, I was passing by a small shed, built up against the face of the rock, when a Stock-Dove (*Columba œnas*) flew out of the doorway. On looking inside the shed, I found on the top of the shed wall, immediately below the roof-tiles, and hidden by an old iron stove-pipe, a nest with two eggs.—H. H. CORBETT, Doncaster, 15th June 1900.

Untidy Nest of Song-Thrush.—Some readers may have noticed how untidily the Missel-Thrush sometimes builds her nest. This evening I went up to one built in the wide fork of two nearly horizontal branches of an Austrian pine, away from the trunk, but found it was a Song-Thrush's nest, with two feathered young and an addled egg. The centre of the nest having no support, the materials there were hanging untidily down some four or five inches below the bottom. It was the most untidy nest of *Turdus musicus* that I have seen.—JOHN P. THOMASSON, Woodside, Bolton, 10th July 1900.

The Nesting Gull of Foulshaw Moss.—During my recent visit to Kendal my sister-in-law, Mrs. Longmire, with whom I stayed, had brought to her a clutch—indeed more than one, subsequently—of what were called Curlew's eggs by the farmer who got them. They were large (3 inches by 2 inches averaged) and olive, spotted and streaked with two shades of blackish and green brown, but not pyriform. Is it the Herring Gull or the Lesser Black-backed? The clutch was always two, as brought away for table use, but possibly more would have been laid if the reavers—one cannot call them farmers—of the gullery had risked them being quite fresh. The Curlew mostly breeds on the inland moors, I believe.—F. A. LEES, Leeds, 11th June 1900.

'Curious Site for a Blackbird's Nest.'—I regret that in this account (Naturalist, June 1900, p. 164) the owners of the nest were given as Blackbirds, whereas they were Song Thrushes (*Turdus musicus*). It seemed to be so generally understood by the 'natives' the birds were Blackbirds, that although at the time I wrote I had seen the head and tail of the bird as she sat on the nest, over and over again from the railway carriage windows, it had never occurred to me that it might be a Thrush. One day, however, as the train stood opposite, the bird happened to raise herself in the nest, when I at once saw the mistake which had been made. The bird was unmistakably a Song Thrush. I am told the station master was heavily 'bribed' to part with the nest of young birds, but am glad to say he firmly refused, and they got safely away. The parent Thrushes were perfectly fearless, feeding the young ones constantly even when a train was standing immediately opposite the nest. The site was, if anything, even more remarkable for a Thrush than it would have been for a Blackbird.—GEO. T. PORRITT, Crosland Hall, Huddersfield, 3rd July 1900.

A LIST OF FLOWERING PLANTS, FILICES, EQUISETACEÆ, MOSSES, HEPATICS, AND LICHENS, NOTED OR TAKEN AT WOODHALL SPA, LINCOLNSHIRE, JULY 1899.

Miss S. C. STOW.

Court Leys, Brandon, Grantham.

This list is an attempt to give an accurate description of the flora of the only Lincolnshire Spa, as it appeared at the end of July, after a hot summer. There are about 300 species of plants in the neighbourhood, but very few, if any, among them are good ones.

I looked for *Silene quinquevulnera* in the small piece of waste ground by the Victoria Hotel, where it once grew. But I did not find it, unless an old and dry plant, which had lost all its seeds, was this species. If I had obtained fertile seeds I would have grown them and found out if it is still with us. I received Jersey seeds last year and grew them in the garden here. They have flowered, but are only quite miniature plants three inches high. *S. anglica* was as abundant in the cornfields as *S. noctiflora* is about Grantham. *Rubus idæus* was very common on all the roadsides round Woodhall. I saw plants of an *Agrimonia* I did not know, perhaps *odorata,* four-and-a-half feet high, and much branched. On the part of the golf links which is nearest the Bath House *Cnicus arvensis, flore albo,* was more abundant than the type. Some patches were twelve feet across. *C. palustris flore albo* was common too. I saw *Stratiotes* for the first time, but could not reach a specimen. *Agrostis canina* was abundant by the moors and woods, and *Aira caryophyllea* by the roadsides and in the meadows. The hay at the end of July was only just being cut, and was led directly, as well it might be, for it was quite burnt up. A hundred years ago Arthur Young wrote, 'Everything in hay-making that I have seen in Lincolnshire is barbarous,' and there are places where these words are applicable now. I tried to find a boggy spot such as marsh plants love, but did not succeed, the long drought having dried them all up. This told its tale on the Mosses, Hepatics, and Lichens, and they were very hard to find; and if it had not been for discovering some damp places in the Bracken Wood, I should not have had nearly so many.

Anemone nemorosa L.
Ranunculus trichophyllus Chaix.
Ranunculus peltatus Sch.
Ranunculus sceleratus L.
Ranunculus Flammula L.
Ranunculus Lingua L.
Pond near Bracken Wood.
Ranunculus acris L.
Ranunculus repens L.
Berberis vulgaris L.
Nymphæa lutea L. Kirkstead.
Papaver Rhœas L.
Papaver dubium L.
Papaver Argemone L.
Chelidonium majus L.
Neckeria claviculata N.E.Br.
Wood by the Bath House.
Nasturtium officinale R.Br.
Cardamine pratensis L.
Cardamine hirsuta L.
Sisymbrium officinale Scop.
Brassica Sinapistrum Boiss.
Bursa Bursa-pastoris Weber.
Lepidium campestris R.Br.
Lepidium Smithii Hook.
More abundant than the last.
Teesdalia nudicaulis R.Br. Abundant by Tower-on-the-Hill Moor.
Viola arvensis Murr.
Viola ericetorum Schr.
Polygala vulgaris L.
Blue flowers only.
Silene Cucubalus Wibel.
Silene anglica L.
Abundant in the cornfields.
Lychnis alba Mill.
Lychnis flos-cuculi L.
Cerastium glomeratum Thuill.
Cerastium triviale Link.
Stellaria media Cyr.
Stellaria Holostea L.
Stellaria graminea L.
Arenaria serpyllifolia L.
Sagina procumbens L.
Sagina apetala L. Among the grass by Tower-on-the-Hill Moor.
Spergula arvensis L.
Buda rubra Dum.
Abundant by the roadsides.
Hypericum perforatum L. Scarce.
Hypericum quadratum Stokes.
Hypericum humifusum L.
Hypericum pulchrum L. Abundant.
Malva moschata L. var. flore albo only. The type has never been recorded for the Woodhall neighbourhood.
Malva sylvestris L.
Linum catharticum L.
Geranium sanguineum L. Escape.
Geranium molle L.
Geranium dissectum L.
Geranium Robertianum L.
Erodium cicutarium L'Hérit.
Oxalis Acetosella L.
Acer campestre L.
Ulex europæus L.
Cytisus scoparius Link.
Very abundant.
Ononis spinosa L. and var. flore albo.
Medicago lupulina L.
Trifolium pratense L.
Trifolium repens L.
Trifolium hybridum L.
Trifolium procumbens L.
Trifolium dubium Sibth.
Lotus corniculatus L.
Lotus uliginosus Sch.
Ornithopus perpusillus L.
Tower-on-the-Hill Moor.
Vicia hirsuta Gray.
Vicia gemella Crantz.
Vicia Cracca L.
Vicia sativa L.
Lathyrus pratensis L.
Spiræa Ulmaria L.
Rubus idæus L.
Common on the roadsides.
Geum urbanum L.
Potentilla silvestris Neck.
Potentilla reptans L.
Potentilla Anserina L.
Alchemilla arvensis Scop.
Agrimonia Eupatoria L.
Very fine specimens.
Rosa canina L.
Rosa rubiginosa L.
Tower-on-the-Hill Moor.
Rosa arvensis Huds.
Pyrus Aucuparia Ehrh.
Cratægus Oxyacantha L.
Sedum acre L. Roadside by Tower-on-the-Hill Moor.
Callitriche vernalis.

Lythrum Salicaria L.
Epilobium angustifolium L.
Epilobium hirsutum L.
Epilobium parviflorum Schreb.
Epilobium montanum L.
Circæa lutetiana L. Bracken Wood.
Bryonia dioica Jacq.
Hydrocotyle vulgaris L.
Conium maculatum L.
Apium nodiflorum Rech.
Ægopodium Podagraria L.
Chærophyllum temulum L.
Anthriscus vulgaris Bernh.
Œnanthe fistulosa L.
Œnanthe Phellandrium Lam.
Æthusa Cynapium L.
Silaus pratensis Bernh.
Angelica sylvestris L.
Peucedanum sativum Br. H.
Heracleum Sphondylium L.
Daucus Carota L.
Caucalis Anthriscus Huds.
Hedera Helix L.
Sambucus nigra L.
Lonicera Periclymenum L.
Galium verum L.
Galium saxatile L.
Galium palustre L.
Galium Aparine L.
Sherardia arvensis L.
Valeriana officinalis L.
Valerianella dentata Poll.
Scabiosa succisa L.
Scabiosa arvensis L.
Solidago Virgaurea L.
Bellis perennis L.
Filago germanica L.
Filago minima Fr. Fields near Tower-on-the-Hill Moor.
Gnaphalium uliginosum L.
Gnaphalium sylvaticum L.
Pulicaria dysenterica Gærtn.
Achillea Ptarmica L.
Achillea Millefolium L.
Anthemis Cotula L.
Chrysanthemum segetum L.
Chrysanthemum Leucanthemum L.
Matricaria inodora L.
Tanacetum vulgare L.
Tussilago Farfara L.
Senecio vulgaris L.
Senecio sylvaticus L. Very abundant.
Senecio erucifolius L. One specimen only.
Senecio Jacobæa L.
Arctium minus Bernh. Waste ground near Victoria Stables.
Arctium intermedium Lange.
Cnicus lanceolatus Willd.
Cnicus palustris Willd. and var. flore albo.
Cnicus arvensis Hoffm. The var. flore albo abundant.
Centaurea nigra L.
Lapsana communis L.
Crepis virens L.
Hieracium Pilosella L.
Hieracium boreale Fr. Frequent.
Hieracium umbellatum L. Very abundant.
Hypochæris radicata L.
Leontodon hirtus L.
Leontodon hispidus L.
Leontodon autumnalis L.
Taraxacum officinale Web.
Tragopogon pratense L.
Sonchus oleraceus L.
Sonchus asper Hoffm.
Sonchus arvensis L.
Campanula rotundifolia L.
Calluna Erica DC.
Erica Tetralix L.
Erica cinerea L.
Hottonia palustris L. Pond near Bracken Wood.
Lysimachia vulgaris L. Bracken Wood.
Lysimachia Nummularia L.
Lysimachia nemorum L.
Anagallis arvensis L. Some specimens had pink flowers.
Samolus Valerandi L.
Ligustrum vulgare L.
Erythræa Centaurium Pers.
Symphytum officinale L. Waste ground near Victoria Stables.
Lycopus arvensis L.
Myosotis palustris Relh.
Myosotis arvensis Lam.
Volvulus sepium Junger.
Convolvulus arvensis L.
Solanum Dulcamara L.
Verbascum Thapsus L. Escape.
Linaria vulgaris Mill.

Scrophularia aquatica L.
Scrophularia nodosa L.
Veronica arvensis L.
Veronica serpyllifolia L.
Veronica officinalis L.
Veronica Chamædrys L.
Veronica Anagallis-aquatica L.
Veronica Beccabunga L.
Euphrasia officinalis L.
Bartsia Odontites Huds.
Melampyrum pratense L.
Mentha hirsuta Huds.
Mentha sativa L.
Mentha arvensis L.
Lycopus europæus.
Calamintha arvensis Lam.
Nepeta Glechoma Bnth.
Prunella vulgaris L.
Marrubium vulgare L.
Stachys Betonica Bnth.
Stachys sylvatica L.
Galeopsis Tetrahit L.
Lamium album L.
Ballota nigra L.
Teucrium Scorodonia L.
Ajuga reptans L.
Plantago major L.
Plantago media L.
Plantago lanceolata L.
Plantago Coronopus L. Abundant on the roadside by Tower-on-the-Hill Moor.
Scleranthus annuus L. Abundant in cornfields and by the roadsides.
Chenopodium album L.
Atriplex hastata L.
Polygonum Convolvulus L.
Polygonum aviculare L.
Polygonum Hydropiper L.
Polygonum lapathifolium L.
Rumex crispus L.
Rumex Acetosa L.
Rumex Acetosella L.
Euphorbia Helioscopia L.
Euphorbia Peplus L.
Humulus Lupulus L.
Urtica dioica L.
Parietaria officinalis L.
Betula verrucosa Ehrh.
Alnus glutinosa Medic.
Quercus pedunculata Ehrh. Bracken Wood.
Fagus sylvatica L.
Salix alba.
Populus alba L.
Elodea canadensis Mich.
Stratiotes Aloides L.
Listera ovata R.Br.
Iris pseudacorus.
Convallaria majalis L., in seed. Bracken Wood.
Scilla festalis Salisb., in seed. Bracken Wood.
Juncus bufonius L.
Juncus squarrosus L.
Juncus glaucus Leers.
Juncus effusus L.
Juncus lamprocarpus Ehrh.
Juncus acutiflorus Ehrh. More abundant than the last.
Luzula campestris DC.
Luzula sylvatica Bicken.
Typha angustifolia L. Pond by Bracken Wood.
Sparganium ramosum Huds.
Lemna minor L.
Lemna trisulca L.
Alisma Plantago-aquatica L.
Alisma ranunculoides L. Reed's Beck.
Eleocharis palustris R.Br.
Carex vulpina L.
Carex remota L.
Carex riparia Curtis.
Carex ovalis Good.
Carex vesicaria L.
Carex binervis Sm.
Milium effusum L.
Phalaris arundinacea L.
Anthoxanthum odoratum L.
Alopecurus pratensis L.
Phleum pratense L.
Agrostis canina L.
Agrostis palustris Huds.
Agrostis vulgaris With.
Aira caryophyllea L. Roadsides and pastures.
Aira præcox L.
Aira cæspitosa.
Aira flexuosa.
Holcus mollis L.
Holcus lanatus L.
Trisetum pratense Pers.
Arrhenatherum avenaceum B.

Phragmites communis Trin.
Cynosurus cristatus L.
Dactylis glomerata L.
Briza media L.
Poa annua L.
Poa trivialis L.
Glyceria fluitans R.Br.
Festuca ovina L.
Bromus sterilis L.
Bromus mollis L.
Bromus asper.
Brachypodium gracile Beauv.
Brachypodium pinnatum Beauv.
Lolium perenne L.
Triticum repens L.
Hordeum murinum L.
Pteris aquilina L.
Equisetum arvense L.
Equisetum limosum Sm.

MOSSES.

Sphagnum acutiflorum Ehrh.
Atrichum undulatum.
Polytrichum aloides Hedw.
=(Pogonatum).
Polytrichum juniperinum Willd.
Polytrichum commune L.
Pleuridium alternifolium Rab.
New to N. Lincs. 54.
Ceratodon purpureus Brid.
Dicranella heteromalla Schp.
Campylopus pyriformis Brid.
Dicranum scoparium Hedw.
Dicranum majus Turn.
Leucobryum glaucum Schp.
Fissidens taxifolius Hedw.
Grimmia pulvinata Sm.
Tortula muralis Hedw.=(Barbula).
Tortula papillosa Wils.=(Barbula).
New to N. Lincs. 54.
Barbula fallax Hedw.
Funaria hygrometrica Sibth.
Webera nutans Hedw.
Bryum argenteum L.
Mnium rostratum Sch.
Mnium hornum L.
Thuidium tamariscinum B.&S.
Brachythecium rutabulum B.&S.
Brachythecium velutinum B.&S.
Eurhynchium prælongum B.&S.
Eurhynchium myosuroides Schp.
Plagiothecium denticulatum B.&S.
Hypnum purum.
Hypnum cupressiforme L.
Hypnum cuspidatum L.
Hypnum Schreberi Willd.
Hypnum riparium L.
Hylocomium splendens B.&S.
Hylocomium squarrosum B.&S.
Hylocomium triquetrum DeNot.

HEPATICS.

Lophocolea bidentata Nees.
Marchantia polymorpha L.

LICHENS.

Cladonia pyxidata Fr.
Cladonia rangiferina Hoffm.
Parmelia physodes.
Peltigera canina L.

NOTE—AMPHIBIA.

Natterjack Toad at Seascale (ante, pp. 161, 223).—Mr. Hodgson might have proved his point more fully, as the following list of places for *Bufo calamita*, from Macpherson's 'Fauna of Lakeland,' p. 464, shows:—Bowness-on-Solway, Silloth, Allonby, Egremont, 'the kitchen garden at Castletown'; Seascale therefore carries the record further South. Possibly Mr. Macpherson could have added more, but the great fault of his book is this want of localities.—S. L. PETTY, Ulverston, 7th July 1900.

NOTE—FUNGI.

Something Like a Mushroom.—On the 8th July 1900, whilst watching the process of mowing a nine-acre meadow field at Cadney, near Brigg, Lincolnshire, I saw a giant Mushroom. It was as flat as a table and formed a perfect circle. In measurement it was 37½ inches in circumference and 12½ inches across. This shows that it was of a perfect shape. The stalk was 5½ inches high, and 3¼ inches girth one inch from the ground. It was slightly grub eaten. The colour on the underneath side was dark chocolate.—MAX PEACOCK, Bottesford, Lincolnshire, 10th July 1900.

NOTE—MAMMALIA.

Bat Flying by Day.—A Bat, presumably a Pipistrelle, flew slowly past me while sitting in bright sunshine at 8 a.m. on the 11th May 1900, in the Arboretum at Lincoln, and within two yards, so that I had a good sight of it.—J. EARDLEY MASON, Lincoln, 17th June 1900.

NOTE—DIPTERA.

Diptera taken at Bottesford, Lincolnshire.—The following species have been taken by me on or about 21st May 1900, and named by the Rev. A. Thornley:—*Empis tesselata, Chilosia albitarsis, Chrysomyia polita.* —MAX PEACOCK, Bottesford, 12th July 1900.

NOTE—COLEOPTERA.

***Rhagium bifasciatum* at Lincoln.**—Among a few Coleoptera recently submitted by me to the Rev. Canon Fowler for identification is a specimen of *Rhagium bifasciatum*, taken from under the bark of a dead *Pinus austriaca* in June 1898, in the Lincoln Arboretum, by Gentel Smith, one of the gardeners.—J. EARDLEY MASON, Lincoln, 30th June 1900.

NOTES—FLOWERING PLANTS.

***Spergularia rubra* near Sheffield.**—This plant is particularly fine and abundant for a considerable distance along the Manchester Road, in the neighbourhood of Bell Hagg, near Sheffield. It grows at the base of the rough stone wall on the north side of the road, and has now been in flower for a month.—A. E. BRADLEY, Leeds, 4th July 1900.

***Chelidonium majus* at 750 feet in Upper Wharfedale.**—Yesterday I found two plants of the above-named flower near the river in Arncliffe. I have constantly visited the same spot for nineteen years, but I have never before seen the larger Celandine in this locality. This is the first record of it in Upper Wharfedale. Mr. F. Arnold Lees fixes the extreme limit of its range at 600 feet, and his station for it in the basin of the Wharfe is at Boston Spa, more than thirty miles from here.—W. A. SHUFFREY, Arncliffe Vicarage, 21st July 1900.

Caraway-seed Kex in West Lancaster.—On Whit-Monday, in the course of a ramble inland from Morecambe, avoidant of the not pierless holiday crowd, along Outermoss Lane off the Euston Road to the right and south in the direction of White Lunds; on both banks of a diked lane, white with the blossom of *Ranunculus floribundus, heterophyllus,* and *submersus*; I noted many clumps of *Carum Carui** in flower and young fruit. It is an alien, of course, but seemed well-established. With it was some *Lepidium Draba,** presumably likewise ballast brought, for the new Heysham branch line of the Midland Railway crosses the line near where it grew most plentifully. An alien grass, *Bromus arvensis,** was also seen. What interested me most, because I had not noted it before, however, was that the Blisterwort (*Ranunculus sceleratus*) by one water-slype having to grow up through water had (as in the case of *Sium latifolium*) been compelled by the environing exigency of its situation to produce palmi-partite floating leaves on long stalks! Some of these leaves were quite submerged; others lay water-lily-like on the stagnant surface, their towering for bloom retarded; for normal specimens in the earth bank were in early flower, not having had to await the falling of the water-level. The fact shows how nearly related is the yellow shining-leaved Blisterwort to the Batrachium section of *Ranunculus.* I was also glad to see that the wet rocky steep of Heysham Head on the sea-side of the ruins still supports *Osmunda regalis,* uneradicated because of the inaccessibility, to most people, of the place where it grows; whilst the pretty white English Stonecrop (*Sedum anglicum*) adorns the rocks in the vicinity.—F. ARNOLD LEES, Leeds, 11th June 1900.

NATURALISTS AT LINCOLN.

Rev. EDWARD ADRIAN WOODRUFFE-PEACOCK, L.Th., F.L.S., F.G.S.,
Vicar of Cadney; Organising and Botanical Secretary, Lincolnshire Naturalists' Union.

A large number of the members of the Lincolnshire Naturalists' Union and of the Lincolnshire Science Society met, on the 11th of September 1899, at Castle Hill House, Lincoln, the residence of Dr. G. M. Lowe, M.D., F.R.C.P., F.R.B.S., F.R.M.S., President of both Societies, and, after a light luncheon, divided into various sections and proceeded to the work of the day. The botanical and zoological sections, under the leadership of the Rev. E. Adrian Woodruffe-Peacock, went to Newball Wood. The geologists, under Mr. Preston, F.G.S., and the Rev. E. Nelson, found their way to Handley's pit. The archæologists and photographic section remained near home, visiting the Cathedral, the Roman remains, and the Castle, conducted by Dr. E. Mansel Sympson, who proved an admirable exponent of the various objects of interest. On their return to the Castle Hill at four p.m., Dr. Lowe entertained the members in a large marquee erected on the lawn, and after substantial refreshment the business of the meeting was continued in the presence of an increased audience. Among those who had accepted invitations to the meeting were the Dean of Lincoln; Revs. Adrian Woodruffe-Peacock, Cadney; Alfred Thornley, F.L.S., F.E.S., South Leverton; C. Wilkinson, Toft Newton; Edward Walker, Willingham; J. Gurnhill, Stockwith; E. T. Noakes, Newark; J. T. Fowler, Winterton; J. Conway Walter, Langton; W. H. Daubney, Leasingham; Rev. Jno. and Mr. and Mrs. Fernie, Burton; Revs. A. Hunt, J. N. Britten, E. Nelson, and Canon Rowe, F.G.S., Lincoln; Mr. Eland Shaw, Doncaster; Mr. W. Lewington, Market Rasen; Mr. T. Stow, Court Leys, Grantham; Dr. Cassall, Ashby; Mr. W. C. Brown, Doncaster; Mr. B. Crow, Mr. Goulding, Louth; Mr. Geo. Parker, Grimsby; Mr. Henry Preston, F.G.S., Grantham; Mr. J. S. Sneath, Mr. W. Scorer, Dr. Mansel Sympson, M.A., M.D., etc., Mr. G. A. Grierson, F.L.S., etc., and many others.

In opening the sectional proceedings, Dr. Lowe heartily welcomed all those who had honoured him with their presence. He had received numerous kind letters from members from all parts of the country, who had expressed deep regret at not being able to join the meeting. With many it was a matter of great difficulty to leave their ordinary occupations

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for a whole day just after their annual holiday, and with others that holiday was still in progress. The membership of the two societies now reached the respectable figure of 223, and he hoped that with this growing force something would soon be done to give science, both natural and physical, in Lincolnshire, first, a permanent home, secondly, the means of making useful observations, and thirdly, of recording them. The first required the establishment of a museum, which would at once be a memorial of the great men who had been born and lived in Lincolnshire, amongst whom he might be allowed to mention Sir Isaac Newton, Sir John Franklin, Lord Tennyson, and one who was working amongst them only a few months since, their first President, the late eminent ornithologist, Mr. John Cordeaux. Relics and specimens of the life work of such men, open for the inspection of the public, appealed to and stirred the spirit of ambition and emulation in talented young men and women far more powerfully than statues and memorial windows, whose very familiarity begot forgetfulness. As a repository of specimens of the fast disappearing fauna and flora of our former fen country, of specimens of local antiquarian interest, of specimens bearing on the technique of our local arts and manufactures, a museum worthy of our great county would soon become invaluable. Next month the county authorities, whose public-minded generosity has already enabled the Museum Committee to store many valuable specimens in the Castle buildings, will consider an application for space within the Old Keep to erect buildings for an Observatory for the reception of astronomical instruments offered to the county, and for a meteorological station, the usefulness of which to the county and country at large would be difficult to over-estimate, for correct records of wind pressure, of barometric pressure, of local rainfall, and of earth and atmospheric temperatures are among the necessities of our daily life. Although, said Dr. Lowe, the situation from our point of view almost amounts to a crisis, we have the satisfaction of knowing that we are in the hands, not of a French tribunal, but of the representatives of the ratepayers of the county.

The work of the geologists was reported by Mr. H. Preston, F.G.S., as follows:—

The Geological party, under the guidance of Rev. E. Nelson and Mr. Henry Preston, F.G.S., visited the brick pits of Mr. Handley and the Lincoln Brick Co., recently known as Swan's pit. In the latter pit the various zones of the Upper Lias were

examined, together with the overlying Northampton Sands and lower beds of the Inferior Oolite. At the bottom of the pit the so-called fish and insect beds were found, which forms the base of the Upper Lias, and in Handley's pit, which lies immediately below Swan's pit, type fossils of the Middle Lias were obtained. As was pointed out to the members of the societies, the most interesting part of the afternoon's study lay between the fish and insect beds of the Upper Lias and these easily-identified clays of the Middle Lias. Normally the Middle Lias consists of two divisions, the Upper or Marlstone Rock

From Negative by *Rev. E. Nelson, M.A.*

Middle Lias Section, Handley's Pit, Lincoln:

Mr. Henry Preston, F.G.S., pointing out the top of the 2 feet limestone band.

bed, and the Lower, consisting of clays, sands, and ferruginous limestone bands and nodules. Two zonal ammonites are identified with these divisions, *Ammonites margaritatus* being the one typical of the clays of the lower division, and which seldom, if ever, reaches up into the marlstone in this county, and *Ammonites spinatus* of the marlstone, but which not uncommonly is found associated with *margaritatus* in the lower division of the Middle Lias. It had been pointed out some years ago by Mr. W. D. Carr, who had well studied the Lincoln Lias, that

the Marlstone Rock bed did not occur at Lincoln, but that the sands and clays passed directly upwards into the Upper Lias. More recently, in a detailed description of the section in Handley's pit by Mr. J. H. Cooke, F.G.S. (Geological Magazine, June 1897), it was asserted that the marlstone did occur at Lincoln, and it was largely that the members might have an opportunity of judging on these two opposite opinions that this excursion had been made. One of the commonest type fossils of the marlstone is the brachiopod shell *Rhynchonella tetrahedra*, which often occurs in great masses, forming the rock itself. In Handley's pit there occurs a band of limestone about two feet thick which Mr. Cooke identified as the marlstone. This identification depended upon the fragment of one shell which appeared to him as *Rhynchonella tetrahedra*. This limestone band was carefully examined, but none were fortunate enough to find any trace of the type fossil, and, lithologically, the band appeared very different in character to the marlstone which occurs both north and south of Lincoln. Furthermore, the clays which overlie this band contain some of the commonest and most easily identified fossils of the lower division of the Middle Lias, and *Ammonites margaritatus* occurs in its most regular form both in the band and for at least seven feet above it. In most other parts of the county the top surface of the marlstone is taken as the upper limit of the Middle Lias, and the clays which occur immediately above it are placed in the Upper Lias. Also, where the junction is well seen it is generally found that a certain amount of erosion has taken place before the deposit of the Upper Lias has commenced. These facts seem to demonstrate that this limestone band is only a more highly-developed example of the numerous other bands in the Middle Lias clays; that the clays lying immediately above it belong still to the lower division of the Middle Lias, and that sufficient proof is not yet forthcoming to show that the marlstone does occur in the Lincoln Lias.

Numerous fossils were collected from the Middle Lias in Handley's pit, and from some broken nodules found in the lowest portion of the pit *Ammonites capricornus* was obtained; so that it was thought possible that the lower limit of the Middle Lias was reached, and the Lower Lias appearing, but as the division is a palæontological one, and as *capricornus* sometimes occurs out of place in the Lincolnshire Lias, it will be necessary to prove the absence of *margaritatus* (an undisputed Middle Lias species) before the definite thickness of the Middle

Lias in this pit can be ascertained. Local members were urged to keep a close watch for future developments in this pit, both above and below, and to make as complete a collection of fossils as they could, so that the museum might benefit from this most interesting section.

Newball Wood being on boulder clay there was not much in the floral way to report; Mr. J. S. Sneath kept the register for the day. The best species were as follows:—

Hypericum humifusum.
Agrimonia Eupatoria.
Sanicula europæa.
Convallaria majalis.
Scilla nutans.

The Mosses were collected by Mr. Thomas Stow and named by his daughter. Considering the dry weather, they were not a bad gathering.

Atrichum undulatum L.
Polytrichum commune L.
Polytrichum juniperinum Willd.
Dicranella heteromalla Schp.
Dicranum scoparium Hedw.
Fissidens taxifolius Hedw.
Mnium undulatum L.
Mnium hornum L.
Homalia trichomanoides Brid.
Thamnium alopecurum L.
Thuidium tamariscinum B.&S.
Brachythecium rutabulum B.&S.
Brachythecium velutinum B.&S.
Eurhynchium piliferum B.&S.
Eurhynchium crassinervium B.&S.
Eurhynchium prælongum B.&S.
Eurhynchium Swartzii Hobk.
Eurhynchium striatum B.&S.
Plagiothecium denticulatum B.&S.
Amblystegium serpens B.&S.
Hypnum cupressiforme L.
Hypnum purum L.
Hylocomnium splendens.
Hylocomnium squarrosum B.&S.
Hylocomnium triquetrum B.&S.

HEPATIC.

Lophocolea bidentata Nees.

LICHENS.

Cladonia pyxidata Fr.
Peltigera canina L.

Dr. Cassall looked after the Lepidoptera. He had little occupation, and so assisted me in my work of general collecting. For the Insects and Spiders the Revs. A. Thornley and O. Pickard-Cambridge have kindly acted as verifiers. The Lepidoptera were but three species:—*Triphæna pronuba*, two larvæ of *Cabera pusaria*, and one of *Clisiocampa populi*.

The Insects submitted to the Rev. Alfred Thornley by me were only a small gathering, but contained some very interesting species.

HEMIPTERA (HETEROPTERA).

Podisus luridus Fab. A northerly record for this species.

Nabis brevipennis Hahn. Five examples. One developed ♀, a form which is very rare. In a letter I had from Mr. Saunders about it he informs me that he has never seen a British example of this form. This specimen was given to Mr. Saunders.

Miris lævigatus Linn. Five examples.

Lygus pratensis.

Phytocoris tiliæ.

(HOMOPTERA).

Philænus spumarius.
Aphrophora salicis.
Aphrophora alni.

COLEOPTERA.

Coccinella 7-punctata.
Galerucella viburni.
Adalia bipunctata.
Apoderus coryli.
Apion subulatum.
Meligethes rufipes.
Crepidodera aurata.
Plectroscelis concinna.

The Spiders and Harvestmen were as follows:—

Xysticus ulmi Hahn.
Xysticus lanio C.L.Koch.
Linyphia triangularis C.L.K.
Lycosa annulata Thor.
Tibellus oblongus Walck.
Meta segmentata C.L.Koch.
Cyclosa conica Menge.
Pachygnatha listeri Sund.
Epeira diadema C.L.K.
Linyphia insignis Bl.
Linyphia montana C.L.K.
Philodromus dispar Walck.
Oligolophus morio Fabr.
Oligolophus agrestis Meade.
Lioburnus rotundus Latr.
Phalangium cornutum Linn.

The hospitality was on a lavish scale, Dr. Lowe paying for the carriages and all expenses, and providing an admirable string band to add enjoyment while discussing his viands. It is needless to say the vote of thanks the Rev. Canon Rowe moved, and Mr. B. Crow seconded, met with more than the usual warmth of reception.

NOTE—TRICHOPTERA.

***Leptocerus dissimilis* near Lincoln.**—Among some insects taken by me at Sudbrooke, near Lincoln, on the 21st May 1898, is one, *Leptocerus dissimilis*, which Mr. G. T. Porritt has determined, and states is 'rather a good species, but the only one of interest among your specimens.'—J. EARDLEY MASON, Lincoln, 17th May 1900.

NOTE—LAND AND FRESHWATER MOLLUSCA.

***Pisidium amnicum*, etc., at Saltfleetby, Lincolnshire.**—During a brief visit to Lincolnshire, in April, I had the pleasure of accompanying my brother on a walk, occupying the greater part of a day, from Saltfleetby to the sea, and thence to Saltfleet and Donna Nook and back. Among weed which had been thrown out of the great drain along the left of the road at Saltfleetby we found dead shells of *Pisidium amnicum* and *Sphærium lacustre* v. *brochoniana*, two forms of Pelecypoda which we had not previously collected in Lincolnshire, and which are additions, as far as the north of the county is concerned, to Mr. Roebuck's list of the land and freshwater Mollusca of Lincolnshire, published in 'The Naturalist' in 1887. The water in this drain was in places very clear, and we could see, as of old, the bulky and lethargic *Viviparus contectus* on the mud at the bottom in some abundance. We were not provided with a scoop, and thus could not ascertain whether *Segmentina nitida* (=*Planorbis lineatus*) was still living in its old habitat in the dikes on the right of the road; we saw in these dikes, however, still in Saltfleetby, *Bythinia leachii*, *Planorbis corneus*, *Planorbis contortus*, *Limnæa palustris*, etc. For the rest of the walk we saw nothing of note, except that among the dead shells of *Helix nemoralis*, which were very numerous on the sandhills and warrens at Saltfleet, we found one little group all smaller than usual, and of these two or three had the spire considerably raised. I am indebted to Mr. J. W. Taylor for the varietal name of the *Sphærium* above noted.—H. WALLIS KEW, 13th May 1900.

Naturalist,

LINCOLNSHIRE WATER MITES.

C. F. GEORGE, M.R.C.S., etc.
Kirton-in-Lindsey, Lincolnshire, April 1900.

When it is remembered that the following list of Water Mites is the result of the work of one individual, in a very limited and hilly area of the county of Lincoln, it will be seen that it must necessarily be very incomplete; as, however, I am not aware that any list of these beautiful and interesting creatures has (so far as Lincolnshire is concerned) been previously published, I trust it will be of use as a foundation to be added to by other workers, and perhaps also by future observations made by myself. All English students of Water Mites are greatly indebted to Mr. Soar for his excellent figures of these creatures, which make their identification so much easier. To him it has been a labour of love. All these mites have been collected within an area of ten miles from Kirton-in-Lindsey.

WATER MITES—HYDRACHNIDÆ.

Atax crassipes (Müller). Fairly common. For a figure see the International Journal of Microscopy and Natural Science for April 1897.

Cochleophorus vernalis (Müller). Found singly.

Cochleophorus spinipes (Müller). Found singly.

Hydrochoreutes ungulatus (Koch). Not common. For a figure see Science Gossip for November 1899, p. 178.

Hydrochoreutes krameri (Piersig). Not common.

Curvipes conglobatus (Koch). Common. For a figure see Science Gossip for April 1899, p. 327.

Curvipes carneus (Koch). Not common. See Science Gossip, April 1899, p. 329.

Curvipes longipalpis (Krendowsky). Occasionally found in numbers. See Science Gossip, February 1899, p. 265.

Curvipes nodatus (Müller). Not very common. See Science Gossip for January 1899, p. 225.

Curvipes fuscatus (Hermann). Common in small ponds in spring. See Science Gossip for March 1899, p. 292.

Curvipes rufus (Koch). Common; varies greatly in colour, forming several varieties.

Curvipes obturbans (Piersig). For figure see Science Gossip, April 1899, p. 327.

Curvipes ambiguus (Piersig).

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Acercus liliaceus (Müller). For figure see Science Gossip for February 1900, p. 261.

Acercus cassidiformis (Haller).

Wettina macroplica (Piersig). For figure see Science Gossip for July 1898, p. 33.

Pianocercus leuckarti (Piersig). For figure see Science Gossip, March 1900, p. 302.

Piona ornata (Koch).

Piona flavescens (Neuman).

Pionopsis lutescens (Herman).

Atractides spinipes (Koch). For figure see Science Gossip for August 1899, p. 79.

Hygrobates longipalpis (Herman). Very common. For figure see Science Gossip for September 1899, p. 102.

Lebertia tauinsignita (Lebert). For figure see Science Gossip, July 1899, p. 45.

Sperchon sp. (Kramer). I have not yet identified the species.

Limnesia histrionica (Herman). Extremely common. For figure see Science Gossip for June 1899, p. 18.

Limnesia maculata (Müller). Common in certain places.

Limnesia undulata (Müller). Not rare.

Limnesia kœnikei (Piersig). Common.

Oxus strigatus (Müller). For figure see Science Gossip for November 1899, p. 177.

Frontipoda musculus (Müller). For figure see Science Gossip for October 1899, p. 138.

Axonopsis complanata (Müller). For figure see Science Gossip for December 1898, p. 193.

Brachypoda versicolor (Müller). Very common. For figure see Science Gossip for December 1899, p. 209.

Mideopsis orbicularis (Müller). For figure see Science Gossip for July 1899, p. 46.

Midea elliptica (Müller). For figure see the International Journal of Microscopy and Natural Science, October 1897.

Arrenurus globator (Müller). Very common. For figure see Science Gossip for December 1882, p. 272.

Arrenurus securiformis (Piersig). Not common. For figure see Science Gossip for December 1897, p. 187. Called *A. festivus*.

Arrenurus caudatus (DeGeer). Common. For figure see Science Gossip for December 1897, p. 273. Named *A. buccinator*.

Arrenurus cylindratus (Piersig). For figure see Science Gossip for December 1897, p. 187. Called *A. buccinator.*

Arrenurus compactus (Piersig). For figure see Science Gossip for December 1882, p. 273. Called *A. viridis.*

Arrenurus maculator (Müller). For figure see Science Gossip for December 1882, p. 273.

Arrenurus crassipetiolatus (Kœnike). For figure see Science Gossip for March 1897, p. 264.

Arrenurus claviger (Kœnike). For figure see Science Gossip, April 1884, p. 80. Named *A. tricuspidator.*

Arrenurus bruzelii (Kœnike). For figure see Science Gossip for March 1897, p. 264.

Arrenurus albator (Müller). For figure see Science Gossip for January 1883, p. 10.

Arrenurus crassicaudatus (Kramer). For figure see Science Gossip for December 1897, p. 187, fig. 6.

Arrenurus forficatus (Neumann). For figure see Science Gossip for January 1883, p. 10, fig. 19. Called *A. perforatus.*

Arrenurus sinuator (Müller). For figure see Science Gossip for January 1883, p. 10, fig. 13.

Arrenurus bifidicodulus (Piersig). For figure see Science Gossip for April 1884, fig. 46. Called *A. integrator.*

Arrenurus solidus (Piersig). For figure see Science Gossip, December 1899, p. 210. Named *A. integrator.*

Arrenurus truncatellus (Müller). For figure see Science Gossip for April 1884, p. 210.

Diplodontus despiciens (Müller). For figure see Science Gossip for August 1899, p. 80.

Hydryphantes ruber (DeGeer). For figure see Science Gossip for January 1900, p. 233.

Thyas thoracatus (Piersig).

Eylais extendens (Latreille). For figure see International Journal of Microscopy and Natural Science, July 1897.

Hydrachna cruenta (Koch).

Hydrachna leegei (Kœnike). Rather common.

Hydrachna globosa (DeGeer). For figure see Science Gossip for April 1900, p. 337.

Limnochares holosericea (Latreille). For figure see International Journal of Microscopy and Natural Science for July 1897.

NOTE—NEUROPTERA.

Dragonfly new to Yorkshire at Askham Bog.—At the excursion of the Yorkshire Naturalists' Union to Askham Bog on the 2nd of June, the most interesting neuropteron taken was *Brachytron pratense,* a dragonfly hitherto unrecorded for the county of York, and which was not uncommon. The pretty *Libellula quadrimaculata* was taken by Mr. B. Morley. *Agrion puella* was plentiful, and *Ischnura elegans* was also reported.—GEORGE T. PORRITT, Crosland Hall, Huddersfield, 25th July, 1900.

NOTES—LEPIDOPTERA.

Hummingbird Hawkmoth near Milnthorpe, Westmorland.—To-day (24th July) the Hummingbird Moth (*Macroglossa stellatarum*) visited my garden, as this species has done on two previous occasions, at long intervals. On each occasion it seemed to have a preference for the scarlet geranium and allied varieties.—GEORGE STABLER, Levens, Milnthorpe.

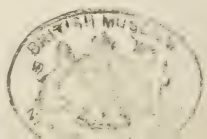
De-abdominated Insects.—I send you a box of insects which I picked up in Poolthorn Wood, Cadney, Lincolnshire (Div. 3), on Saturday, 21st July. They have all been de-abdominated by bird or beast, but I cannot yet say which.—MAX PEACOCK, Bottesford, Lincolnshire, 23rd July 1900.

The specimens sent by Mr. Peacock represent the following species of Lepidoptera:—*Xylophasia polyodon, Plusia iota, Liparis auriflua* (three specimens), *Botys urticalis, Ourapteryx sambucata* (two specimens), *Arctia menthastri, Abraxas grossulariata, Pterophorus pentadactylus, Pelurga comitata.* I should say it is most likely the bodies have been eaten by Bats, but birds may have been the culprits. But these insects are species which would evidently be captured whilst on the wing, which dispenses with any notion that mice may have done it. They are, too, all early evening flying species, though late enough for most of the small birds to have gone, or be about going, to roost. Nightjars would, I think, swallow the moths entire; hence my inclination to accuse Bats.—GEO. T. PORRITT, 25th July.

BOOK NOTICE.

In the recently-issued '**Furness Lore,** being the Transactions of the Barrow Naturalists' Field Club for the 4th, 5th, and 6th years ending 24th March 1882,' **edited by Harper Gaythorpe,** F.S.A.Scot., there is some interesting reading. First, because in those days there *was* a Naturalists' Field Club at Barrow; secondly, we have papers of that period, and a little later, brought up to date; thirdly and lastly, it is explained in the introduction how, why, and by whom the club lost its character and became 'Literary and Scientific'—at least those are the words used—in 1880. Some work was done in various branches, and good lectures, as the list on p. 51 shows, both in subjects and speakers, were given. The excursions were good and resulted in no loss. As usual in 'Literary and Scientific' affairs the archæological papers are the best and well illustrated. But possibly the truly literary part borne by Mr. Gaythorpe in his efforts to trace the missing minute books from Barrow to various places, California included, are quite as valuable as several papers here condensed, the one on 'Evolution' especially, if not those on 'Scott' and 'The Drama,' this latter being elementary. I believe Stopford Brooke's 'Prima' was issued before 1880, and, if so, the information could be obtained for a shilling and better put. It is, to an old collector of dramatic books, depressing. Altogether this 'No. 2, Vol. 3,' is a credit to those concerned. It has benefited largely by the editor's beautiful drawings, and although it may seem presumptuous to congratulate Mr. Gaythorpe on his work, one can safely say that he has made a good index and chosen a good printer.

As the volume is not an ordinary 'Club' issue, it may fall into the hands of some member of the Yorkshire Naturalists' Union, and no doubt it will be read with the care that the geological and the 'Park,' p. 37, papers deserve.—S. L. P.



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THE BECK—A STUDY.

Rev. EDWARD ADRIAN WOODRUFFE-PEACOCK, L.Th., F.L.S., F.G.S.,

Vicar of Cadney; Organising and Botanical Secretary, Lincolnshire Naturalists' Union.

The days have long since gone by when a worker, a conscientious worker I mean, in any branch of thought or study, has to justify and defend his labours from charges of being a waste of time. We, who have been born since the days of Hugh Miller and Charles Darwin, have learnt as truisms from our youth up, that the whole of our education is intended to make us think clearly, and draw accurate conclusions from the facts that we observe; and conversely, that the conscientious observation of any given class of facts is an education in itself. So I make no apology for bringing forward a number of simple, and to me very interesting, facts gathered together in the course of some years during my 'studies' on the brooks and streams we rightly call *becks* in Lincolnshire.

The good old word *beck* has a very fine history of its own. It is found in all the Teutonic languages, from old Norse and old Icelandic downwards, but Gothic preserves no form of it whatever. It is used from Cumberland in the north to Lincolnshire in the south, and in all the intermediate counties which were occupied by Danes and Norwegians. It is employed, especially in literature, to denote a stream with a stony bed or rugged course, such as those of the 'North Contree'; but is quite as appropriately applied to our more sluggish and sandy wold and cliff streams, provided they are not dykes of man's design and construction.

What an open-air and healthy study a beck is, one, say, like that of my native parish, Bottesford, which lies seven miles on the west of Brigg. This little beck rises on a marshy spot on Crossby Warren—which is now a gull pond, an off-shoot from Mr. Sutton-Nelthorpe's famous Twigmoor ponds—and flows four miles south, and then five south-west, till it falls into the river Trent at East Butterwick. My notes were not all made on this one beck—though, as lads, my brothers and I knew it by heart, and had a name for every bend and tree—for it has been my good luck to study a number, but for fear of detaining you too long I shall not particularise the exact spot where each observation was made.

1900 September 1.

Flashing brightly in the summer sun, where it ripples over its pebbly bed or round the stepping stones of the cattle ford, or lying in the afternoon haze like a burnished mirror of silver in its quiet pools, broken ever and anon into rhythmical dimples by a rising dace or tiny minnow, or rushing wildly along, bank full, as we say locally, with a swollen torrent that the strongest swimmer would not care to face, flooding the lowlands all along its course, or gurgling hoarsely under an iron canopy of ice, that grips everything but its narrowest and most broken shallows, as in the 59 days' frost of the winter of 1890-91, the beck runs on eternally to find its last home in the river, a perpetual study for a man of observation.

Beautiful at all seasons of the year, the beck is most delicately lovely, perhaps, on a bright and sunny winter morning, when a rime-frost has coated with a filigree of fairy tracery every branch and tangled spray, straggling grass and decaying sedge. In such a dress, as we say locally, the beck can claim the notice and sometimes the close attention of the casual passer by, for even the dullest intelligence cannot but mark the contrast between the dark grey rushing waters and their brilliant frost setting. No wonder our streams with their winding nooks, shaded with hawthorn, willow and ash, alternating with clear and open reaches, as straight as nature's rule can make them, have appealed to poets and painters alike irresistibly; no wonder they have softened into contemplative gentleness the untiring anglers, who know them better than anyone else.

Life, for some not fully explained reason, is more frequent and joyous along the beck's banks than anywhere on the fields and uplands above. The heron, kingfisher, mallard and vole are its own natural children, but why the hare, brown rat, weasel and woodpecker, as well as most of our common birds, are to be found making their homes and nesting in hedge and tree, or in the rank herbage and dead-thorn cattle fences along its course, requires some further explanation. A steady watch, however, kept through a long summer's day, at one end of a reach, especially if the water lies along the side of a grass field skirted by a wood, will explain much—more perhaps than anyone but a born naturalist would have the instinct or patience to observe. Days and weeks of careful watching, from the first peep of dawn till night shrouds everything in darkness, are hardly enough to satisfy the true student of nature, as many problems must be left unsolved. Week in week out, the observer must be up before the dawn of day till noon, or from midday to

midnight, till the signs and sounds of the living language of nature become something more to his watchful ear than the chaotic jumble of a strange tongue.

The implements of a true watcher can scarcely be called simple, though they should be as handy and portable as possible. I myself have done most of my observing with only the occasional use of the fine tools I shall recommend to you. First, and the most important of all, comes the naturalist's note book, the reporter's penny one I have always found very handy. It slips into the inner pocket in a second with the Swan pen, which should be its invariable companion. The ink dries almost as soon as it is written, and never becomes illegible like the lead of a pencil, so that it can be read a dozen years afterwards as easily as at the moment it left the pen. Remember, too, that every fact observed should be noted down at once while still quite fresh in the mind, whether an explanation can be given or not. A few hours' delay in making notes when you are trying to unravel the mysteries of living nature will often colour the surroundings in an unnatural way in the mind, or cause you to drop out points of detail intensely interesting in themselves, and which, when recovered later, are not infrequently found to be of the first importance in suggesting an explanation.

The next most important thing is the observer's field glass. A man who is watching living nature cannot get on without one, and loses much when he attempts it. If he goes too near, he disturbs the harmony of the animal and bird life he is seeking to understand. Any ordinary field glass is better than nothing, but perhaps the 'Squat' binocular field glasses, of Messrs. Ross, are most specially suitable for observing animals and birds at short ranges, as they possess moderate power, fine definition, and a large amount of light. For long distance observations binocular telescopes by the same firm, or their new 'Prismatic' binoculars, are the best known to me. The latter are magnificent and inexpensive instruments considering their great power and very portable form. In observing a reach of a beck from a fairly long distance the best hand-glass made is easily surpassed by a good telescope. I once used one with a four-inch object lens, mounted on a tripod stand, with a vertical and horizontal movement, which was simply perfection. It could be left in any given position ready for use, leaving the hands quite free, and was equally good for night and day and photographic work, but in using it by day the observer at times required a hand-glass too.

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The only other thing necessary is a photographic camera, with a few extra rapid dry plates. In a paper of this kind it is impossible to mention the many suitable forms for work such as I am describing, but one cannot go far wrong in employing the 'Anschutz,' supplied by Messrs. Ross. Take this piece of practical advice about natural history appliances, deal with as good a firm as you can find, and stick to them; and consult them too if a difficulty occurs and you have no experienced friend to give advice. The camera should be stowed away carefully, but always ready for immediate use. For instance, a young cuckoo, blind, naked and instinctively jealous, is caught in the act of throwing its foster-brothers from the nest of the pied wagtail, or a pike is observed preparing for its deadly rush, or an otter is seen feeding on a freshly-caught fish. The sensitive plate takes an instantaneous image of the scene and surroundings.

When the place of observation has been carefully chosen, and the impedimenta of his trade are hidden away behind a screen of willow-herb (*Epilobium hirsutum* L.), cow-mumble (*Heracleum sphondylium* L.), or hemlock (*Conium maculatum* L.), that grow so rankly among the grass on the banks, a splendid field for inquiry is opened out before the eager eyes of the naturalist as he gazes through his glass up the beck. Let us suppose that a lovely summer day is at its noon, with a mild north-easterly breeze blowing, which clears the atmosphere from damp, and waves everything to and fro with a lullaby influence under a cloud-flecked sky—a day in fact like scores we have had during the last few summers. The heat is not intense, or it would deaden the activity of plant and animal life, and everything is so clear that the minutest object in view is perfectly defined, though in the language of the artist they are 'unpleasantly hard.' In the near foreground the yellow iris or cornflag is past the flower, and some of its seeds are well advanced. It stands high above the bur-reed, arrowhead, and flowering rush, in the water, all of which come into view at a single glance, while close to the bank on the wet mud, the water figwort is just opening its peculiar flowers. Its inconspicuous dark-purple or crimson corolla is remarkable for the scale on the under side of its upper petal, causing it often to be mistaken for a dead nettle by the unlearned or young beginner in botany. The herb-robert cranesbill, scarlet pimpernel, and canterbury bells, just bursting into flower on the top of the bank, are well set off by the white forget-me-not, which does not fade pink or blue when drying, and the delicate blue-purple

trumpets of the greater skull-cap lower down. But I must not name a tithe of the blossoms and plants within sight and reach on a June morning, or my paper will be as interesting to the majority of my readers as the list of a Botanical Record Club.

Let us imagine that we are directing the four-inch object glass telescope about 350 yards up the stream, where a bend in the beck shows us a length of its course, and that we are looking out for what we may observe, not caring in the least whether we study one thing or another. You can watch the water voles, or, as they are popularly called, water rats, at your leisure. Perched on a small stone that juts out from the bank is one pretty little fellow, ready drawn up for a dive. About a foot below, a few inches under water, something is moving over the sand. Our friend takes a sudden header and rises a second or two later, swimming rather lower than usual in the water, and gaining the side, easily climbs up to his resting place again with a six-inch eel in his mouth. Two bites through the head settle the question whether this very slippery morsel shall escape or not, and then he eats it deliberately, beginning with the head. But with his meal hardly commenced he disappears with a sudden spring into his hole just below on the right, and we are left for a moment or two in doubt as to what can have frightened him away. Doubt is soon satisfied in this matter, for into the field of vision comes soaring a noble heron, in the act of taking a magnificent circular sweep with his long powerful wings, before he alights by the flags at the further end of the pool beyond the water vole's resting-place. There, if undisturbed, this most ancient fisherman will sit hour after hour, with his shoulders high up, the neck bent backwards, and his head sunk upon his chest, ever ready for one of those lightning thrusts with his long beak, which neither fish nor fry can escape, if they are once well within reach. Every feather in his long and handsome plumage can be studied at leisure, as it fluffs up over his gaunt but iron framework of light bone and sinewy muscle. The little vole fears him as the Hindoo dreads the man-eating tiger, for when the heronsew is hungry he will eat almost anything, provided it is instinct with life. Even the eternal digger, the little mole, does not escape his sharp eyes in frosty weather, when the ponds are all shut up by ice. The great problem is to know when the heron is not hungry, so the water vole gives a wide berth to his long grey acquaintance, who appears in the distance to a casual observer to be a bundle of dried flags stranded by the beckside. But the vole has no

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cause to dread the heron while he remains at rest; he knows the bird never makes a spring forward before he strikes home; when the heron moves afoot his pace is a leisurely and stately walk. You will soon see the vole again on his favourite stone, perhaps holding a small flounder or dab (*Pleuronectes flesus* L.), which has worked its way up the beck over the lower sandy reaches from the Trent. He may be sitting on his haunches, grasping it with his fore-feet, and nibbling away at it as if it were a biscuit. As a rule he lives on green food or grain, and a fish diet is only an occasional luxury, or perhaps a corrective. Many good naturalists maintain that the vole never touches flesh or fish, but they have not observed sufficiently. Would they tell us that the dog and cat never eat grass? If you watch a vole for a day you will see how varied his diet is, and how he delights to mix up play and feeding with plenty of diving and swimming. The plant which, while young, is apparently his favourite is the cow-mumble (*Heracleum sphondylium*), most commonly called hemlock in Lincolnshire. If you mark the spot which he frequents and take the trouble to go and look, you will see his runs to and fro to fetch it, and the stubble left where his sharp incisors have been at work. But you will be getting tired of the vole. So raise the glass slowly and take a sweep of the reach from end to end. Water-hens, water-rails, and a metallic-plumaged kingfisher, sitting on his bare perch of willow, or darting off and hovering like a hawk over his prey in mid stream ere he swoops down upon it, all come into view in turn, and may be watched in every action, as they carry on their domestic economy. They soon become friends, almost as fearless and certainly as well known as the little vole; the kingfisher especially, for he is a quaint old world bird, the very glint of whose eye is a living language that must be learned by continual intercourse.

A much rarer bird on our becks than any of those I have yet named is the summer snipe (*Totanus ochropus* Linn.), as it is locally called. I have seen it from early June till late August on Cadney and Kettleby Becks, in North Lincolnshire, and by mid-June a pair were joined by four of their young on the latter stream. But though I have seen them leave the water-side, and fly into Howsham Barf Wood, which follows* the bank of the

* The part following the meandering of the beck has since been cut down, but the ancient wood where the birds were always lost is still intact. It is undoubtedly the last portion of an old woodland; *Adoxa* and other species prove it, which are never found in Lincolnshire except in old wood-

stream for some distance, I never could detect their nesting-place. If I went to the spot in the wood where I lost the bird, I never obtained another view of it passing over from my fresh coigne of advantage, it mattered not how long I waited. Mr. Cordeaux showed it to me on Aylesby Beck in June too, but he completely failed to discover its eggs, even when employing boys to climb the trees in the covers, to look into every likely place and old nest. Crows, I do not mean rooks, build there.

But while I have been keeping you so long telling of my cuckoo studies,* had we been looking through the telescope up the beck, we should have seen many visitors come to the water and retire. First a pair of ring-doves flew down from the neighbouring trees, having first taken a wide flight round to see that all was safe. Then a hare and a common rat followed suit, both lapping the water without wetting their feet, though the long grass was still wet with the dew of the previous night. Later on in the day, finches, sparrows, and members of the blackbird tribe come for their bathe in the sunny shallows, where they sport and flirt in fancied security. I was busy watching their fluttering and preening operations one day, when a slight wave, coming not too quickly up the glassy surface of the water of the beck, at a short distance beyond the birds, attracted my attention. I knew its meaning well from past experience, and with my eye to the telescope awaited the result with no little excitement. There was nothing above water to give the least notice that danger was at hand, except that trifling wave which soon passed, for the old hunter was wily and cautious in the extreme as he drew nearer, stealing up inch by inch, the birds continuing their toilet operations without heed, till suddenly, with a mighty rush and splash, a pike sprang more than half out of the water, and seized a fully grown thrush in its relentless jaws. The doomed bird's companions flew away in all directions, and the fish returned to his 'lair' or 'station' to digest his afternoon meal at his leisure, leaving the beck forsaken for the time by everything but the heron and a young water-hen.

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land or their sites. It contains a rookery, and the usual complement of other species of birds. The wood is on the steep slope to the beck; and Barf is from Old Norse *bjarg*, Danish *bjerg* and *berg*, and 'means for the most part a low ridge of hill.'

* The portion of this paper referring to the cuckoo has been published as a separate article. See Naturalist, April 1900, pp. 99-108, and note, p. 114.

This pike was an old friend of months' duration, and had taken up his abode in the deep pool by the reeds the March before. Three males and a female fish had arrived about the same time from the river, where they retire for the winter for warmth and a better supply of food; and most furious contests took place for supremacy and the possession of the lady, who was the largest fish of the four. After watching their interminable struggles for some time, I 'wired' the lady and her two smaller admirers, leaving the old leviathan, which weighed about seven pounds, to have the reach to himself; at the same time stopping his exit at both ends by a strong wire net from bank to bank.

Now 'wiring fish' is the most unsportsmanlike sport I know of, but I have tried all ways of taking pike, and still prefer it. All ways are a certainty in streams like our becks; and at one time I would have undertaken to catch every pike of any size in a given distance in a given time if they were not spawning, but it is quite a different thing with the wire. You may visit the water day after day before you can find a fish lying conveniently for slipping a wire over and round it, and having a successful heave. Of the three fish just mentioned, the two males were taken on the morning and afternoon of the same day after a little dexterous manipulation; the lady was captured the following evening, but not with the same brilliant success. It was a bright sunny late afternoon in mid April, with a sharp north-easter blowing, when I set out to look for her amongst the weeds, where she was soon found in her usual berth, but from which she as quickly retired to the deeper water for additional security. There she would have been absolutely indistinguishable from the surrounding mud and decayed vegetation to any but the most practised eyes. I was using a double twist of copper wire, and with the depth of the water found the greatest difficulty in working the noose round the fish, especially as she was lying head up stream close to some rotting flags of the previous summer. The water was so deep and the ripples so continuous, that I had to stand on the very edge of the bank to see at all, and had to plant my feet very firmly before striking. The fish came overhead easily and well, but, alas, not safely. The bank had been considerably undermined by the floods of the preceding winter, and the sudden jerk and heave proved too much for its tenacity; and before I could quite realise the whole position, I was reposing three feet below the surface of the water on a soft bed of ooze, on

the exact spot from which the fish had been drawn so swiftly, my head cradled on a portion of the bank on which I had been standing. I was in a sad case. The banks were of liassic clay and steep, and in my soaked condition it took a hard and long struggle to gain the top, after many useless attempts, with the lustre of one's exploit dimmed, and a good suit of clothes ruined by mud and water. The moral is simple. Do not go poaching, even in the name of science, be you parson or layman; for it is poaching now to take a pike at that season of the year even in your own private fish ponds.

But let us imagine we are sweeping the whole wood side beyond the field, called the park, which skirts the beck, in order to notice its abundant animal and bird life. A mole has left the ground, on beetles and grubs intent, and is walking along with unprepossessing gait. They do so occasionally, but I am not satisfied that we know why. Perhaps like some of ourselves they every now and again evince an inquiring disposition, and once having come abroad in the summer daylight, find food too plentiful to be content to carry on their eternal digging operations without a little variety in the way of change, till the winter forces them below ground for good. Though once I remember while out shooting with my brother I saw one above ground in a sharp frost. In this case perhaps a weasel may have been tracking it in its underground galleries. Lincolnshire folk-lore says the mole leaves the ground but once a year to take a little fresh air in the daylight. The upper side of the wood stands upon a bed of stiff liassic clay, the lower side and the grass on the loam and sand deposited by the beck. This light soil is burrowed through and through by rabbits, not the ordinary bunny either, nor the black ones which are almost as common in some districts, but 'the silver-haired,' the rare product of a few isolated spots now, though at the end of last century common enough in places in this county, the skins at that time being worth as much as 3s. 6d. each. There are few above ground at mid-day, but in the evening there will be thousands. The sand where they are now found was not their native home, though they look like natives. They were introduced a couple of generations ago, when the skins were valuable, under the following circumstances:—In a neighbouring lordship a well-known squire possessed a warren which had existed time out of mind; and he set such store by it that he would not give a neighbour and friend, who owned the ground I am speaking of, a few couples of his rabbits to start a warren of his own.

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There are, however, more ways than the most direct one of getting what you want in this sublunary sphere, as the squire found out to his cost. Sir R., his good neighbour and a county magistrate, who looked on a poacher much as we look on a murderer, chose the beck-spring warren I am describing, and destroyed all the common rabbits with ferrets and guns; his head keeper then let it be known on the quiet to certain enterprising 'gentlemen' in the adjoining villages that he would pay five shillings apiece for the first hundred couples of 'silver hairs' to hand, but if anyone was caught poaching there would be 'ructions galore.' No one was caught poaching, and in less than a week the required number of couples was turned loose on the sands, where they throve amazingly as stolen goods always do, I am sorry to say, according to local tradition. Of late years I have come to the conclusion that it is better to poach second-hand than personally.

As we watch the rabbits that are abroad, all young ones during the early hours of the afternoon, there is a movement amongst them, and all in sight disappear as if by preconcerted arrangement. There is some danger afoot, but nothing visible to the eyes using a field glass. The keen scent of the bunnies detects what man cannot, the presence of a dire enemy. A vixen soon steals out of the wood, followed by her five half-grown cubs; little beauties, miniatures of their mother, and more playful and sportive than the most frolicsome of kittens. The vixen holds straight across the open in full view, but the cubs do not follow her far, retiring to the woodside to scamper and play about, but always ready to dart into the cover at the slightest sign of danger. They were born under the roots of a large ash tree on the clay bank on the upper side of the wood, and have followed their dam through the undergrowth and nut trees without fear. Early this year I saw her on the very spot where her cubs are playing now with four admirers, chasing one another about like mad things, and barking till the woodside echoed and rang again. It is very seldom that you hear the voice of the fox except in the late winter.

We had better watch the vixen, her movements will be well worth studying, for, if I do not mistake, she is going to put into practice one of the many tricks at which she has long been an adept. Crossing the grass at a long, even, swinging pace, she jumps down the beck-side to the water's edge. The moment she is out of sight the cubs disappear into the wood, and return straight to their earth, or its immediate neighbourhood, for it is there

she will join them with the result of her forage. Like the other animals we noticed visiting the beck, the fox laps a little water, and then moves along under the shade and cover of the bank, stopping every now and then to smell at a rat-hole, or making a half-playful dart at the voles or shrews in the long grass by the side of her path. If you turn the four-inch object glass on her, you will see she is moving along a regular track she has made by frequent use. She is in no hurry, as you can tell by her gait, a little wasted time will serve her purpose well, as the only object of her present manœuvring is to get to the leeward of the rabbits, just out of sight and scent, as they play in the open. Had she been lucky enough to pick up a pheasant in the cover, she would not have troubled just then about a rabbit, for in a fox's dietary feathers always stand before fur, as many a Lincolnshire farmer's wife knows to her cost. At the pike-pool the vixen stops and looks down into the water at the motionless shark of the beck; she knows full well he is delicious food, but not how to obtain him, though I believe in rare instances both cats and foxes have been known to get expert in snatching fish from their waters. After a little, she moves slowly on with the same careless halting walk, killing time while the rabbits come out to feed and play, till she nears the end of the reach, when she turns up the bank. How changed is her manner of proceeding immediately, with what circumspection and care does she creep and crouch, and how admirable is the spot she has chosen for her purpose. A number of mounds and shallow trenches, covering the ruins and foundations of an old religious house, with thorn bushes, ant-hills, and patches of nettles scattered about, make a splendid cover to approach the rabbits from. We soon lose sight of her in a hollow beyond a buried wall, but looking steadily at the bush half-way down its line, we shall soon see her if the coast is clear. A minute later she is skulking along, close to the ground, to the largest bush on the tower hillock. Now all this stealthy manœuvring has been for one purpose, to make the rabbits believe she has crossed the beck to forage on the other side, as she does sometimes, while she gets to the leeward of them, so that she may approach close up to them without being seen or smelt, either of which things in their case would produce a like result, an incontinent bolt to earth in their burrows. In the bush on the tower-hill the vixen will lie hid for a few minutes, till a fine young rabbit approaches near enough to be suddenly rushed, when she will return straight across the lea and wood to the roots of the old ash tree. Over

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and over again this same trick has been performed as I have watched through the four-inch, but never twice running from exactly the same spot. Very often the fox creeps along out of sight to the very end of the wall bank, and then into a ditch which runs at right angles to it, making her final dash for food from behind a thistle, or one of the little clumps of nettles, where I saw her crouching, perhaps, only half a minute before. When the wind is blowing from the back, she comes stealthily through the wood without her cubs, and catches her quarry by suddenly bounding over or through the fence, calculating exactly upon that fraction of a minute that a rabbit draws itself up to view and consider an unforeseen danger; or she makes her round in precisely the opposite direction, or forages over the beck, as occasion may require. Without doubt the fox is one of the wiliest of our common animals, and if its speed and endurance were equal to its courage and finesse, it would hardly be taken by man and dog.

When we turn the glass again on the beck, we find a stock-dove coming home to her nest from a distant pasture field, where the seeds of the buttercup are already ripening. Notice how she sweeps round and round with tireless wing in ever-contracting circles, before she alights on the bank of the stream, where her young are waiting unfledged and callow. We are not hidden from her sharp eyes, and though we are two hundred yards away and she knows our place of observation well, she is uneasy. Pigeons, perhaps the same pair, have bred in that unused burrow for many seasons, and last year, the former occupant of the pike-pool caught one of the young ones sitting below the nest by the side of the beck, where the water runs unusually deep. The bird was a good six inches from the water's edge, but the fish in passing managed to see it, and stealing up unobserved, secured it by a magnificent dash. "Once a pike-pool, always a pike-pool," might just as well be a proverb as the similar saying about the chub, for if no dam or weir prevents them coming up stream, year after year, a fish is sure to be found in or about the same lair. The reason for this as yet defies the observations of the most adept naturalists. It may be the configuration or depth of the stream brings food within easy reach, or the place is hidden but suitable for the sudden and deadly rush this fish makes. The pike that took the young stock-dove was an eight pounder, too wise to be wired a second time after I had once taken him out and replaced him after weighing operations, but with all

his cunning and strength, no match for his natural enemy, the otter.

One afternoon in the early winter I noticed the spoor of this mighty swimmer on the wet mud by the beck, and followed it for two miles without result. The very next morning I suddenly started one feeding by the side of a long pool, and chased it up and down till I lost all track of it, for the mere pleasure of seeing the air bubbles rise as it swam under water. The next day, passing the lair on my way to shoot ducks, I found the pike lying dead on the turf on the bray or bank top, with its head and shoulders eaten by an otter. By the next morning a fox had disposed of the rest of the fish, except the backbone, as I could see by the tracks on the sand, where I had carefully laid it for the purpose. This was the only time to my knowledge when an otter or otters visited the neighbourhood.

A beck is a glorious study for one who has the eyes to see, the mind to learn, and, most important of all, the heart to interpret its subtle phases and changes with the seasons. It brings teeming life and plenty into what would be otherwise a more or less desolate wilderness as far as the naturalist is concerned. Wherever one exists in its pristine purity, take camera, fieldglass, telescope, and notebook, and force its secrets, many of which are still mysteries to the wisest. It may be a long study ere you know it well, to say nothing of thoroughly, with its flowers, beasts, birds and fishes, disregarding its more minute bank and watery inhabitants. Do not be discouraged at the time it will take, no good work is done in a short period. Charles Darwin even gave nine years to the study of the barnacles, and that special work made him the great, painstaking man he was. Depend upon it, the lesson a beck, or some such simple study, can teach you will be invaluable as a training in the methods which must be followed in learning the art of accurate observation, and by the time you know your subject by heart, you will appreciate the full value of the minutest detail, and will thus be fitted and ready for whatever work comes, even the most delicate scientific inquiry—you will know the value of facts even when you cannot correlate them.

NOTE—MOSSES.

***Eurhynchium myosuroides* var. *cavernarum* at Kirkdale: a Correction.**—The moss mentioned by Mr. Marshall in the August number of 'The Naturalist' as '*Isothecium viviparum* Lindb. var. *cavernarum* Mol., near the Kirkdale Cave,' ought to be *Eurhynchium myosuroides* var. *cavernarum* Mol.—Wm. Ingham, York, 20th August 1900.

NOTES—ORNITHOLOGY.

Birds and De-abdominated Insects.—Birds will occasionally de-abdominate insects, though not, I think, in the number nor of the kind described in the interesting joint note on this subject. I have watched a Great Titmouse (*Parus major*) catch a Bumble Bee, in the late summer when these insects are sluggish, carry it to a bough, pick it clean, head and abdomen, and leave the shell below. I have been told of Blue Titmice (*Parus cæruleus*) doing this wholesale to Bumble Bees in a lime tree; and I have found a number of de-abdominated bees below a flowering lime tree in cold and stormy weather, which I believe to have been picked by Titmice. On 28th June I found Dor Beetles (*Geotrupes* spp.) on the fells that had been de-abdominated, and ascribed the work to Black-headed Gulls (*Larus ridibundus*), of which there were numbers about. The Bracken-clock Beetle (*Phyllopertha horticola*) was just then abroad, over meadow and fell alike, in countless thousands, and it seems probable that this beetle is the main factor in drawing such swarms of Gulls to us at this particular time. But if so, the Gull swallows it whole; and I have found remains of similar beetles, mixed with small sea shells, in the castings about the nests of the Black-headed Gull at Ravenglass. Even the small Spotted Flycatcher (*Muscicapa grisola*), that loves to catch a Butterfly—(Lesser Tortoiseshell, *Vanessa urticæ*) certainly and I think Red Admiral (*V. atalanta*)—if this be young or broken-winged, will swallow its large victim whole. It is odd that Bumble Bees, in a numb or dying state, are preyed upon even by Wasps. I have found numbers below a flowering lime tree in cold weather, neatly decapitated, while a wasp carried away something large, and another moved round, looking apparently for yet whole bees.—Mary L. Armitt, Rydal, 3rd August 1900.

Thrush-Stones and Spotted Flycatcher.—On the 11th of August 1892 I was standing looking out of the window of the oak-panelled room at The Hall, Messingham (Div. 2), North-west Lincolnshire. A pair of Fly-catchers (*Muscicapa grisola* L.) attracted my attention by the frequency of their journeys to one particular spot on a flower border. The post of observation that the birds occupied was the dead bough of a mulberry tree. I watched the birds for at least a quarter-of-an-hour but never noticed them make for any other spot than the one on the border hard by. When my host left me for a short time I went out to inspect the spot and see what was attracting their prey to that particular place. I was not long in doubt as to what caused the flies to gather to this spot. On the flower bed was a stone about the size of an egg. This was literally besmeared all over with snail slime and bruised portions of snails. The shells of the Granny-snail (*Helix aspersa*) and the Big Bandy-snail (*Helix nemoralis*) were to be seen in numbers. This stone must have been the execution-block on which the Thrush had slain at least fifty snails. The flies were attracted by both the shells and mucus-besprinkled stone. The ordinary bluebottle and several other kinds of flies were busy making a meal off what the bird or birds had left. I noticed this fact again this year at Bottesford Manor (Div. 2), North-west Lincolnshire, and again, curiously enough, the tree on which the birds perched to reconnoitre the surrounding garden was a mulberry. Several of these trees were planted in this district about eighty years ago. The birds at Bottesford frequent this spot early and late, making a journey to the stone every few minutes when not engaged in building their nest, which is situated amongst the creepers that grow over the rustic porch. As I stood one evening watching the Flycatchers at work building I noticed that three Midy-creeks (Land-Rails—*Crex crex*) were calling in the adjacent meadows, and that I could also hear the cooing of Turtle-Dove (*Turtur turtur*), Ring-Dove (*Columba palumbus*), and Sand-Dove (*Columba* sp.?), all at one and the same time. Land-Rails were getting scarce hereabouts a few years ago, so I was pleased to note that we had three pairs in such near proximity.—Max Peacock, The Manor, Bottesford, Lincolnshire, 10th July 1900.

ADDITIONS TO THE MOSS-FLORA OF YORKSHIRE.

WILLIAM INGHAM, B.A.,

Organising Inspector of Schools, 47, Haxby Road, York.

Hypnum Schleicheri Hedw. fil., of the 'British Moss Flora,' or *Eurhynchium abbreviatum* Schp. This moss I found on a stiff clay bank in a spot that is always in shade, near Healaugh, Tadcaster, 16th November 1899.

Mr. Dixon calls it an interesting find, as it has hitherto been considered a southern moss only. I have specimens from Sussex, Gloucester, and Hereford, and I am pleased to add a fourth from the north of England.

Hypnum Schleicheri var. ***rigidum*** Boul. This I found near Kirkdale Cave, 22nd May 1899. It is very distinct from type in its rigid and upright growth and pale colour.

Mr. Dixon sent me *Hypnum* (*Eurhynchium*) *Swartzii* Hobk., var. *rigidum* Boul., from Bonchurch, Isle of Wight. My gathering has the long and narrow areolation of *H. Schleicheri*, whereas Mr. Dixon's has the wider and shorter areolation of *H. Swartzii*, but in *habit* they are the same.

Weisia calcarea var. ***viridula*** C.M. This moss I found in the Castle Howard Wood, 18th May 1900, in the presence of Dr. Braithwaite, and Mr. Slater of Malton. The only record of this moss hitherto has been the very vague and unsatisfactory one of 'Scotland.'

Dr. Braithwaite writes that my naming is quite correct.

The type *W. calcarea* has been recorded already in 'The Naturalist' from Knaresborough, where I also found it independently on 7th June 1898.

Weisia crispata C.M. In the Jackdaw Crag Quarry, Tadcaster, 21st January 1898. This must be the moss mentioned by Mr. Marshall in the August number of 'The Naturalist' under the name of *Mollia crispula* Lindb., which is a very different moss from the new one, *W. crispata* C.M. I have found *Mollia crispula* Lindb. in several places in Yorkshire and Durham, and I regard it as a common moss.

I have found *W. crispata* C.M. also in Durham, by the side of Kilhope Burn, and it is an addition to the Moss Flora of Durham. Verified by Mr. Dixon.

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Barbula convoluta var. ***Sardoa*** B.&S. The *Barbula commutata* Juratz. of the London Catalogue of British Mosses.

This very distinct variety of the common moss I found on the border of a cindery path in shade at Barkstone, near Sherburn-in-Elmet, 7th May 1900. It has been verified by Mr. Dixon, and is identical in habit and growth with a specimen from Mr. Nicholson, of Lewes, gathered in Sussex.

Grimmia orbicularis Bruch. From rocks near the Strid, Bolton Woods, 11th August 1898. It has been recorded by Mr. Barnes from Durham, but I believe it has not yet been recorded from Yorkshire.

Leptobryum minus Phil. This beautiful little moss I found on Coatham Marshes, 19th July 1900. Mr. Bagnall, of Aston, Birmingham, confirms my naming as follows:—'I have examined your very interesting *Leptobryum*, and compared it with specimens from Wilson and my own collecting, and find it really distinct from *L. pyriforme,* in its small capsule, with shorter, less defined neck, less developed inner peristome, shorter leaves, and *larger spores,* these latter differing in size nearly as much from *L. pyriforme* as do the spores of *Funaria microstoma* from those of *F. hygrometrica.*'

As the *larger* spores are not mentioned in Husnot's description of Philibert's plant, and as all other points in my plant agree with his description, I announce the plant only provisionally as *Leptobryum minus* Phil.

I shall be pleased to send a good specimen of this moss to any reader who is interested in it.

NOTE—FLOWERING PLANTS.

***Schœnus nigricans* at Askern.**—On Tuesday, 31st July, I spent a couple of hours 'botanising' on the bog at Askern, and among other things I found a sedge that was unknown to me. On examining the plant I concluded that it was *Schœnus nigricans* L.; but this species being so very rare in the West Riding, and quite unknown in the Don valley, I thought that my diagnosis must be wrong. But on sending specimens to Mr. F. A. Lees all doubts were removed, the plant being determined by him as *S. nigricans.*

The only hitherto recorded localities for this species in the West Riding are in the Lune, Ribble, Yore, and Nidd basins, and the altitudinal range is given (Flora of West Yorkshire, p. 452) as from 200-450 feet. It is therefore very remarkable that it should be found growing freely in the Don valley at an elevation of about 20 feet. That the plant has only lately come there is evident. Otherwise so conspicuous a species, in such a well-worked locality, must have been noted, and it seems to me (pace Mr. Moss) to be a strong supporting fact in favour of Mr. Lees' theory of 'substitution.'
—H. H. Corbett, 9, Priory Place, Doncaster, 3rd August 1900.

Naturalist,

LINCOLNSHIRE NATURALISTS AT LINWOOD WARREN.

Rev. EDWARD ADRIAN WOODRUFFE-PEACOCK, L.Th., F.L.S., F.G.S.,
Vicar of Cadney; Organising and Botanical Secretary, Lincolnshire Naturalists' Union.

Members of the Grimsby Natural History Society and of the Louth Antiquarian and Naturalists' Society visited Linwood Warren on Whit Monday, 4th June, leave of access having been kindly granted by Col. Conway-Gordon. Amongst those present were Mr. R. W. Goulding, of Louth; Mr. A. Smith, of Grimsby; Mr. J. S. Sneath, of Lincoln; the Rev. E. Adrian Woodruffe-Peacock, of Cadney; Mr. Max Peacock, of Bottesford. Messrs. J. J. Baldwin Young, F.L.S., M.B.O.U., of Sheffield, and W. Lewington, of Market Rasen, were also out, but did not join the main party.

Several branches of natural history received careful attention, botany, zoology, and entomology especially. The insect-men certainly experienced two of the principal gratifications that may possibly fall to their lot when they are investigating ground with which they are only partially familiar, inasmuch as (1) they found old friends in their accustomed habitats, and (2) they saw several comparatively rare and local insects for the first time. Some of them who no longer continue to collect specimens felt something of their old excitement when they saw their comrades capturing species which they themselves had never seen in their collecting days. They remembered how Charles Darwin, after a cessation of some twenty-five years, felt 'like an old war-horse at the sound of the trumpet,' when he read about the capture of rare beetles, and, like him, they 'boiled with old ardour,' and almost longed 'to begin collecting again.'

The following is a summary of the reports sent in:—

The botanists were a strong party, and Linwood is the home of many well-known local species, which have been recorded in this journal over and over again. *Scilla nutans, Convallaria, Menyanthes, Genista anglica, Lamium Galeobdolon, Paris, Habenaria chlorantha,* and *Ornithopus perpusillus* amongst others made a brave show.

Everyone seemed to take an interest in zoology. A Fox, which had destroyed a Partridge and her nest of eggs, was noted, as were also the Rabbit and Hedgehog, with Common Lizards, a Grass Snake, and the male and female of the Great Warty Newt.

We have to thank Mr. J. J. Baldwin Young for this full list of birds which he has personally noted while visiting in the neighbourhood.

The following species are common or numerous: Missel and Song Thrushes, Redwing, Fieldfare, Blackbird, Robin, Greater Whitethroat, Willow Warbler, Great, Blue, and Coal Tits, Wren, Starling, Jackdaw, Carrion Crow, Hooded Crow, Rook, Spotted Flycatcher, Swallow, Martin, Sand Martin, Greenfinch, House and Tree Sparrows, Chaffinch, Linnet, Corn and Yellow Buntings, Tree Pipit, Meadow Pipit (common on migration), Skylark, Swift (common locally, several nest in Market Rasen), Cuckoo, Ring and Stock Dove, Pheasant, Partridge, Red-legged Partridge, Corncrake, Moorhen, Peewit, Common Snipe, Black-headed Gull. The following notes were appended to the rarer species :—Redstart, a few pairs annually. Lesser Whitethroat, fairly numerous. Garden Warbler, pretty common. Sedge Warbler, fairly common about Claxby. Grasshopper Warbler, not common, but a few pairs about every year. Chiffchaff, fairly common, but local. This may be said also of the Goldcrest and Long-tailed Tit. Tree Creeper, not uncommon. Jay and Magpie, fairly common too. Waxwing, occurs occasionally in hard winters in the firwoods near Claxby. Goldfinch, a pair or two at Claxby. Bullfinch, fairly common. Crossbill, occasionally. Nightjar, fairly common on Winwood Warren. Great Spotted Woodpecker, probably fairly common ; pairs in several woods, as Claxby, Willingham. Green Woodpecker, rather common. White Owl, rather local, not common about Claxby. Long-eared Owl, tolerably common in fir woods. Short-eared Owl, fairly common in October in stubbles according to the Rev. C. Williamson, of Toft Newton. Tawny Owl, tolerably common at Claxby. Sparrow Hawk and Kestrel, fairly common. Heron, odd birds. Bittern, one killed at Usselby, 11th January 1896. Wild Duck, pairs on becks. Wigeon seen in Claxby in November and December 1894. Turtle Dove, fairly common. Coot, the same, but local, near Holton. Woodcock, fairly common. Jack Snipe, not common.

For the observation of insects the day promised well—warmth, abundant sunshine, and glades sheltered from the somewhat bleak wind that prevailed on the Wold hills, afforded conditions extremely favourable for the appearance of insects, and plenty were to be seen.

The butterflies included the Common Whites, the Orange Tip, the Chequered Skipper, and, more abundant than the fore-

going, the Small Copper, the Small Pearl Bordered Fritillary, and the Grizzled Skipper. Of moths the Cinnabar was common, and there were seen four specimens of the splendid translucent-winged Bee Hawkmoth (*Macroglossa fuciformis*), closely allied to the Hummingbird Hawkmoth so often seen in gardens last summer, as well as this. The other insects taken at Linwood Warren were named by the Rev. A. Thornley, M.A., F.L.S., F.E.S., as follows:—

HYMENOPTERA.

Sphecodes gibbus. ♀.
Sphecodes pilifrons. ♀.
Salius fuscus. ♀.
Pompilus viaticus. ♀.
Nomada succincta. ♀.
Andrena nitida. ♂.
Andrena gwynana. ♀.
Andrena chrysosceles. ♂.
Halictus cylindricus. ♀.
Halictus nitidiusculus. ♀ (stylopised).
Halictus morio. ♀.
Tenthredo sp. Very fine thing. ♀.
Tenthredopsis dorsalis (?). One ♂.
Pachyprotasis rapæ. ♀.
Macrophya sp.
Ichneumonidæ. Four examples unknown to me.

DIPTERA.

Chilosia albitarsis. ♀.
Empis tesselata. Two ♀ examples.
Empis sp.
Dioctria rufipes. Three examples.
Sarcophaga carnaria. One ♂.
Pachyrrhina maculosa. ♂ and ♀.

NEUROPTERA.

Panorpa sp. Scorpion Fly.

COLEOPTERA.

Geotrupes typhæus. One ♂.
Rhagium inquisitor. One.
Melasoma (Lina) populi. One.
Timarcha violaceo-nigra (coriaria). Two.
Hister cadaverinus. One.
Corymbites cupreus. Three ♂s (typical).
Phytodecta (Gonioctena) viminalis. One.
Athöus hæmorrhoidalis. Two.
Dolopius marginatus. Two.
Telephorus lividus. Two.
Ragonycha pallida. Three.
Onthophagus nuchicornis. One.
Adalia bipunctata. One.
Coccinella 10-punctata (variabilis). One.
Phyllobius argentatus. Two.
Phyllobius viridiæris (uniformis). Four.
Phyllobius urticæ (alneti). Two.
Strophosomus faber. One.
Polydrusus cervinus. One.
Hypera polygoni. One.
Rhynchites germanicus. One.
Calathus melanocephalus. One.
Amara tibialis. One.
Phyllobius pyri. One.
Bembidium littorale. One.
Malachius bipustulatus. One.
Gastroidea (Gastrophysa) polygoni.
Haltica pusilla.
Priobium castaneum.
Anaspis frontalis.
Cœliodes cardui (fuliginosus).
Orchestes stigma.
Meligethes æneus.

HOMOPTERA.

Triecphora vulnerata. The Scarlet Hopper.

From the well-known brick-pit south-east of Market Rasen, Mr. W. Lewington collected the following beautifully-preserved fossils. I have presented them to the British Museum. The

keeper of the geological department has kindly sent me a list in return. They are all from the Kimeridge Clay, and Mr. Lewington would be happy to collect for any student interested in these beds :—

Nucula menkii Rœmer.
Astarte supracorallina D'Orb.
Ostrea sp. (flabelloides?).
Arca longipunctata Blake.
Arca reticulata Blake.
Anatina sp.?
Trigonia juddiana Lycett.
Rostellaria sp.?
Rostellaria rasenensis Blake.
Cerithium crebrum Blake.
Cerithium forticostatum Blake.
Amm. (Cardioceras) serratus J. de C. Sowerby.
Amm. (Perisphinctes) triplicatus J. Sowerby

We came across the scoriæ of ancient British iron-smeltings on the Warren. It was no doubt the remains of the hydrated ferric oxide of the 'pan-iron' which in sandy soils plays the part of a cementing agent, as can be seen here, and on Manton, and at Scotton Common.* In such moor soils, especially those covered by heather as Linwood, the iron has been dissolved out of the surface soil by the action of the humic acids, the sands on the surface being left remarkably white. The iron passes in solution into the subsoil, where it is re-precipitated, with the result that the sand at a certain depth is cemented together, and an iron-stone produced. This precipitation of the iron oxide may be brought about by contact with calcium carbonate contained in the subsoil, but that can hardly be the case at Linwood. It is more likely the whole action of solution and precipitation is determined by alterations in the condition of the soil. In autumn and early winter, while saturated with water, the iron may enter into solution as a ferrous salt, and be carried below; and in summer time, in a dry and aërated soil, it may be precipitated as ferric oxide. The iron pan would naturally be formed at the line in the subsoil at which oxidation chiefly occurred. Where two or more pans are found one above another, as on Manton Warren, the line of oxidation has been suddenly changed by sand drifting heavily above. The whole matter is one which requires further study.

A high tea was provided for the visitors at Market Rasen after the excursion, the Mayor of Louth (Mr. S. Gresswell), senior vice-president of the Louth Society, presiding with his usual felicitous kindness.

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*See Prof. R. Warington's 'Physical Properties of Soil,' Oxford, 1900, and other authorities.

SPRING'S PAGEANT IN WESTMORLAND AND LANCASHIRE.

F. ARNOLD LEES, M.R.C.S., L.R.C.P.Lond.,
Leeds; Author of 'The Flora of West Yorkshire.'

Scar-buttressed Kendal is, veritably, a Nature's lychnoscope, from outside which at various angles may be glimpsed the elevation of the Host (of bloom) resurrected from the earth at Spring's appointed day, the cosmic 'Floralia.' For ten days this year, in late May and early June, I found vegetation holding high revel, advancing with amazing leaps and bounds from leaf-bud to seed-vessel in marvellous variety of form. Mrs. Humphrey Ward, in her 'Robert Elsmere' and 'Helbeck of Bannisdale,' the latter a 'Catholic' novel, has finely limned the landscape of the Kent river-basin in its more general features. Here I would offer only a few science data, additional to the facts set down in Baker's 'Flora of the English Lake District' (1885) and Martindale's Summary in the First Part of the 'Westmorland Natural History Record' (1888). The 'Sweet o' the Year' is not a favourable time for Mosses or Hepatics, so that I am not able to supplement with aught worthy of definite note the nine papers by George Stabler on those Bryophytes, issued in 'The Naturalist' between October 1888 and November 1898.

Kendal is a much more convenient centre than Bowness or Appleby for the investigation of the Winster and Gilpin basins, betwixt which Whitbarrow lies crouched like some grey ante-diluvian monster with long sloping back and head on paws, stretched north and south on guard over the hill-gate entrance to Lakeland from Milnthorpe and Foulshaw 'mosses.' The little-visited parallelogram with Knipe and Cunswick Tarns for its northern corners, and Strickland Hill and Beethwaite for its southern, is wondrously diversified for a tract under 25 square miles, the florula changing with sometimes startling suddenness twice or thrice in the course of a walk from Kendal west over Scout Scar to the Crossthwaite 'Colony,' or from Cunswick Tarn diagonally over Whitbarrow to Key Moss. The snuff town, too, is the best starting point for awesome Long-Sleddale (best approach to Hawes Water over Gate Scarth and down Mardale); for Whinfell and Hollowgate on the Shap Wells road; for Grayrigg and Low Gill, or the late Mrs. Cottrell-Dormer's Lily Mere above Bendrigg full east on the Sedbergh road; in brief the best imaginable nave for spoke-like excursions at every point of

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the compass. I made seven, in differing directions, during my stay, none of them exceeding a sixteen miles 'out and home' round, each one further fixing the impression of a most diversified flora. Nowhere in England can the contrast between slate-rock and limestone vegetation be better studied by reason of juxtaposition. As a matter of course little specific record was added to Mr. Baker's compact and masterly 'Flora of the English Lake District.' Fifteen years' work by resident botanists since its publication have, I understand, only added four species to the Westmorland county flora.

As the list which follows is only a discursive and personal one, embodying little beyond what mine own eyes saw, and including no 'critical' species, the authorities for the specific names need not be given. Nearly all the stations come within Martindale's district 2: a very few are in '3'—the Lune basin, and where so the fact is noted in the text. The numerals in parentheses after the names merely give the census number for Great Britain from the London Catalogue (9th ed.)—the order and nomenclature being followed.

Ranunculus penicillatus (77). What I so call, a drawn out floating-leafless state of *R. peltatus*, is common in the Kent where less rapid from a mile above Kendal downwards. What I could gather was not *R. fluitans* Lam.; though from its bushy collapsing tassels some botanists might consider it the puzzling *pseudo-fluitans* of Hiern's monograph.

Trollius europæus (63). By the rivers Mint and Sprint above Kendal, and down-carried to Haugh's Bridge under Natland.

[***Pæonia.*** Among the allotment gardeners I was surprised to hear Pæonies (single and double) called 'Magpies'—as at Horsforth and Harewood, near Leeds. I don't know the origin of the name, unless it be indicative of the showy, dandy-like contrast foliage and flower, or anthers and petals furnish when in bloom.]

Nymphæa lutea (91). In Cunswick Tarn.

Castalia speciosa (88). Mrs. Cottrell-Dormer's Lily Mere, which drains into the Peasey beck joining the Beetha, near Whasset, and thence flowing by Dallam Tower into the Kent estuary.

Meconopsis cambrica (14). Laneside, Blakebank, near Crosthwaite, Gilpin basin; but I have little faith in the indigenity of it here—indeed I never saw an unsuspectable station in Westmorland. I call it an acclimatised colonist, originally of garden origin, but otherwise on quite the same footing

as the red poppies of the field. Its seeds soon lose their power of germinating, although dropping where the capsule ripens a moiety come up next season, and, being hardy as regards cold, if the ground is bare, carry on the race. Perennial certainly, but the root-stock is not long-lived.

Chelidonium majus (96). Much more like a native, though generally considered not. Noted at Crossthwaite and up Mintdale.

Arabis hirsuta (96). Cunswick Scar, Haugh's Bridge.

Lepidium hirtum (88). Blakebank and Crossthwaite 'Colony demesne.'

Helianthemum marifolium (9). West face of Scout Scar.

***Viola sylvestris* (*Reichenbachiana*)** (51). The prevailing form in the calcareous-soiled woods.

Stellaria nemorum (47). Mintdale, and on hedge banks by road above Haugh's Bridge away from the stream.

Arenaria verna (28). Seen only on the tabular limestone of Scout and Cunswick Scars and Helsfell.

Geranium sylvaticum (56). Mintdale, above Beck Mill.

Geranium columbinum (76). In plenty about Crossthwaite 'Church town.'

Geranium lucidum (93). In plenty most everywhere.

Impatiens Noli-me-Tangere (24). The Hindson station of Baker's Flora—'Ghyll near Whittington Hall'—south-west of Kirkby Lonsdale, is in Vice-County 60, West Lancaster. I saw plants in a Kendal garden brought thence.

Vicia Bobartii (92). Banks in the Winster and Gilpin basins chiefly. [*Genista anglica* looked out for but *not* seen.]

Prunus padus (68). The Bride of the Spring is nigh everywhere about Kendal the loveliest ornament of scar, wood, and ravine thicket alike.

Geum rivale (93). Underbarrow and Crossthwaite, hybridising with *G. urbanum*, but some years (as this one) like the oak and the ash, *rivale* precedes *urbanum* in flowering by two or three weeks.

Fragaria elatior.* The old high-wood Strawberry of gardens occurs rather plentifully and seeming naturalised on high grassy banks of the road between Scar foot and Underbarrow. No cots near, now. With it grows *Asplenium Adiantum-nigrum* and other true wildings, making a most deceptive combination.

Poterium officinale (64). Frequent by water in Kent valley.

Rosa mollis (71). Occasional about Kendal, but nought like so plentiful as I expected to find it.

Pyrus Aria Ehrh. (50). Rocky bank of the Mint and Kent below Haugh's Bridge, as well as Baker's stations.

Saxifraga granulata (78). Mossy niches of limestone rock by the river Kent, both just above and below Haugh's Bridge.

[***Cotyledon.*** Not seen, and certainly no indigenous integer of rocks or walls in the Kent basin; although recorded for 'Mireslack' by Wilson.]

Sedum anglicum (60). A lovely feature of the rocky soil in pastures on the slatestone between Lightbeck and Underbarrow, and by the Gilpin at Crossthwaite Colony, owing to its neat habit and innumerable black-dotted French white starlike blossoms.

Sedum rupestre* (12). Sparingly, but as at home as any wilding, with *Asplenium Adiantum-nigrum,* on banks of the road between Kendal and Underbarrow, about Lightbeck.

Hippuris (90). The Marestail occurs up to 1,300 feet at Skeggles Water (J. A. Martindale) in peat, near which tarn the same competent naturalist found *Carex limosa.*

***Circæa alpina* (*intermedia*)** (34). By the river Mint above Beck Mill, down-brought from Bannisdale, I suppose.

Ægopodium Podagraria (100). Called 'Dwarf Elder' at Crossthwaite.

Sanicula. Well-nigh ubiquitous in the copses: yet in some counties absent over large tracts.

Myrrhis (65). On steep bushed declivities of the Mint, apparently quite above winter-flood mark, and lower down by the Kent; but I did not trace it up the ravine to its first appearance.

Œnanthe crocata (92). Cowbane—known to the farmers as poisonous. I did not hear it styled 'Dead Tongue.' Noted by the river Mint, and bordering meads from Mint Bridge upwards.

Meum (29). In the slate-fell pastures up Grayrigg.

Adoxa (91). Road bank just above Haugh's Bridge, Natland.

Galium boreale (43). By the Borrow beck and the Lune lower down, in District 3.

Galium sylvestre (28). Prevalent on the limestone, to the scar plateaux. Not noted down-washed: possibly because the creviced white-rock does not give rise to such forceful becks as the slate declivities.

Asperula odorata (106). Park Spring and Cunswick Scar hangers.

Sherardia (109). In fine mats on the bare lime-rock by the road over Kendal Fell to Scar Nick. Baker gives 'cultivated fields,' but I never saw it wilder or lovelier than here, in lavender patches a foot across, where its only competitors were *Sedum acre* and *Sesleria cærulea*.

Valeriana dioica (73). Cunswick Wood and Mintdale.

Antennaria dioica (86). In the benty turf of Bradley-field Allotments with *Arenaria verna*.

Chrysanthemum Parthenium*. Road banks, Underbarrow.

Petasites officinalis (105). Meal bank, and lower down Mint.

Crepis paludosa (62). Wet banks by the larger becks down to Haugh's Bridge.

Hieracium cæsium (19). Rocks in the Mint above Black Mill, probably down-brought from Bannisdale.

Lobelia Dortmanna (38). Loughrigg and Lilymere Tarns.

Vaccinium uliginosum (19). Sparingly, with Cranberry, on Whinfell above Hollowgate.

Pyrola minor L. (68). This does grow in Westmorland at Stockghyll, seen by myself (also in the plantations near Lilymere, in District 2). On the 24th June 1869 (cfr. 'Science Gossip,' 1870, p. 91) I gathered only the robust globe-flowered *media,* but on visits to Ambleside, in at least two subsequent years, I found only the button-bloomed *minor* on dripping shelves amongst the cascades. Certainly both species do or did grow there. A note in Journ. Bot. for March 1900 mentions Crosfield Herb. specimens of *minor,* also from Stockghyll, gathered as far back as 1843 by a guide's daughter—possibly the very man who in 1869 informed me I was 'very fortunate' when I showed him my *media,* he not differentiating. Guides, alas! assist in exterminating: the Journal's note mentions a whole 'sheet' of specimens.

Vinca major.** Road-side between Scar-foot and Underbarrow.

Vinca minor (73). In shrub-wood above the Mill Colony, Crossthwaite, over a large area, and appearing 'wild' enough now. Baker styles it 'Alien,' but surely it has as much right to the rank of Denizen, as *Helleborus fœtidus* or *Inula Helenium,* better than either of which it has made good its hold of the soil. It is censussed and not italicised in the last edition of the London Catalogue.

Symphytum asperrimum.** A mile out of Kendal on the Windermere road, persisting, from original cultivation—as I was told.

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Myosotis sylvatica (45). Neither so abundant nor so frequent in the copses as I had expected; but, being a short-duration perennial, seldom occurring en masse in a spot three years in succession, it is more easily rendered scarce if not extinct in a district than most other species coveted for the garden border.

Polemonium (5). In two places by the Kent, but, I believe, Alien, the washed-down out-throw from some garden. I saw no unsuspicious stations although—to make a distinction often lost sight of—many 'suspicious' ones of species native elsewhere which had established themselves after natural removal. This must be kept in mind by who would understand the flora of a hill district. If the Jacob's Ladder ultimately turned up, growing near the head of one of the many South Westmorland dales, above steadings, like it does in West Yorkshire over Grassington, then the lower-land by-river sites might be admitted as general proofs of indigenity and submission to dispersal law. As said, ante, *Myrrhis* is in similar case; yet it, too, must remain a 'suspect' until found above the highest sheep-fold.

Veronica montana (89). Beck Mill, Mintdale.

Linaria Cymbalaria.* Ivy-leaved Toadflax. Wild enough now, in the sense of quite at home, ineradicable and spreading—a real 'colonist'—on rocks and old walls, not only of Kendal Castle, but in away-from-cottage stations. Noted well nigh everywhere in the sheltered dales, with *Geranium lucidum, Saxifraga tridactylites* for mates; even at Underbarrow with *Ceterach*, the black *Trichomanes* and *Veronica Chamædrys,* and with *Parietaria* on Kendal Castle; in all verity, after a hundred years of acclimatisation, as stickfast as any of them. One likes to see a charming alien hold its own in this way—to point a moral and adorn a vale.

Pedicularis palustris (110). By Cunswick Tarn.

[***Lathræa***. Not seen; though looked out for.]

Lamium incisum (76). Bank near Haugh's Bridge.

Lamium maculatum.* Waysides, Crossthwaite, where only did I see *L. album,* in the hedges.

Primula farinosa. About Lilymere and Bendrigg.

Plantago lanceolata (112) var. ***variegata.*** A pretty striped form, a cream blade with three green stripes where ribs are, found wild by Mr. Whitwell, of the Serpentine Cottage, was shown to me in his garden. When multiplied sufficiently

it will prove a useful as well as novel 'edging' from its neat habit of growth.

Rumex aquaticus (45). ***R. domesticus.*** Stony places near the Lune between Beckfoot and Kirkby Lonsdale, in Div. 3.

Parietaria diffusa (94). Pellitory. Kendal Castle walls, and on a crumbling bank near Underbarrow. Not given for Westmorland at all in Baker's Flora.

Salix phylicifolia (29). By the river Lune in several places below Tebay.

Juniperus nana (23). On Scout Scar, southern end, as well as the recorded Whitbarrow. I venture to think this; in its dwarf, lie-to-rock habit; and broadened, boat-shaped needle leaves; to be an alteration in character acquired through the stress of exposure to strong wind and low temperature for goodness knows how many centuries: a 'species' in the making rather than one primevally, structurally distinct. In localities more 'leender'—to use a local term—the ordinary *communis* bush was frequent.

Taxus (52). Cunswick and Scout Scar talus.

Cephalanthera ensifolia (34). Old wood under Cunswick.

Orchis latifolia (42). Mountain pastures about Lily Mere.

Allium Scorodoprasum (17). On the Kent bank above and below Haugh's Bridge, three miles south of Kendal.

Paris quadrifolia (73). Park Spring Wood, Cunswick.

Tamus (69). About Crossthwaite and Underbarrow.

Sparganium minimum (54). Cunswick Tarn. *Cladium* not seen there-round, although looked for, but one corner has become inaccessible through encroachment of Sallows, etc., forming an unsafe swamp.

Luzula vernalis (108). Cunswick.

Carex Goodenovii (***vulgaris***) var. ***juncella*** Fries. In tufts by Cunswick Tarn. Also Lilymere. True *stricta* (*Hudsonii*) nowhere seen; and I have little belief in the filamentous-sheathed plant occurring among the hills; although I strongly incline to the view that Linnean *cæspitosa* will be found to do so. The Bendrigg moorland about Lilymere—an elevated peaty tableland, the gathering ground of a reservoir three miles round, while the mere itself is half a mile long—has a peculiar though rather meagre florula through lack of lowland thermophiles, and calls for thorough investigation at the hands of some resident botanist. Nearest Sedbergh perhaps, it remains an out-o'-the-way shooting ground. The York and Westmorland

naturalists should have an over-Sunday gathering there, by special permission of the late Mrs. Cottrell-Dormer's executors and the other landowners, when important results might be expected.

Carex paludosa (77); ***acutiformis.*** By the Kendal Canal towards Natland.

Aira præcox (111). Seen only on slate rocks in the grounds of the Crossthwaite 'Commune.'

Avena pratensis (76). Bank over Kendal towards Bradleyfield.

Melica uniflora (96). One of the commoner grasses about Kendal on damp banks, with *Sesleria* on the dry.

Kœleria cristata (89). Turf edge near Underbarrow, not plentiful. Apparently not before on record for Westmorland at all!

CRYPTOGAMIA.

Ceterach (68). Kendal Castle wall. Several plants on a high farmhouse wall, Underbarrow.

Phegopteris polypodioides (76). Beech Fern. North end of Park Spring Wood. Bank of lane leading from Crossthwaite 'Colony' to Gilpin Mill.

Asplenium Adiantum-nigrum (107). Crumbling bank of road between Scarfoot and Underbarrow.

Osmunda (89). In most of the gardens at Kendal reaved from the 'moss' thickets about—where now, alas! non est. This, and that, told me how they had got it 'so many' or 'so many' years back: the noblest-looking of cryptogamic feræ naturæ.

Ophioglossum (87). Adder's Tongue. Beyond Underbarrow Post Office in the most singular and unexpected station. It was positively rank in the half-dry lime-mud water-channel by the highway side; somewhat stunt but fruiting freely—hundreds of specimens, in fact the only green thing in the gutter, there!

Among the Mosses I noted almost nothing that is new. *Ditrichum flexicaule* in the grassy turf at Scarfoot; *Dicranum scoparium* near the same place; *Grimmia apocarpa*, Kendal Fell; *Philonotis fontana*, Lilymere; *Neckera crispa*, Kendal Fell; *Anomodon viticulosus*, rocks by road to Scarfoot from Kendal; and *Climacium dendroides* by Cunswick Tarn; with *Homalothecium sericeum* abundant on walls, *Hypnum molluscum* on banks, and *H. squarrosum* amid grass. *Hylocomium triquetrum*, too, was in plenty at Scarfoot.

THE BIRDS OF CHESHIRE.

The | Birds of Cheshire | by | **T. A. Coward** and **Charles Oldham** | with six photogravure illustrations | and a map of the county. | Manchester | Sherratt and Hughes | 27 St. Ann Street | 1900 [8vo. cloth, viii. + 278 pages, 6 plates and map].

The authors of this work are to be congratulated on having supplied a long-felt want, and have spared neither pains nor trouble in doing so. They complain with some cause that 'Ornithology has found but few votaries among Cheshire naturalists,' but in Cheshire as in every county there are numbers of persons, sportsmen in particular, who are keen observers of nature, and who take a special interest in birds and their habits, but who are deterred from recording their observations either because they consider them too trivial or because they do not know to whom to communicate them. To these a published volume on the local fauna is invaluable, and we hope that 'The Birds of Cheshire' will soon find its way into every library in the county. To ornithologists the book is no less welcome, containing as it does an accurate record of the birds of the whole county, the utmost care having been taken to sift all available evidence concerning doubtful occurrences, to notify and acknowledge all sources of information, and to verify the references of other authors. The result is presented in a handsome volume with six good illustrations. We think such a work should have been furnished with a better map; it is impossible to judge from the one before us in which direction the border streams, Etherow, Goyt, and Dane, are supposed to flow, and if the elevations had been noted, the characteristic meres tinted, and the extensive parks and tracts of forest land also brought out in colour, the physical features of the county, well described in the introduction, would have been made more clear.

The authors claim that there is satisfactory evidence of the occurrence in a wild state of two hundred and twenty-two species during the present century, and attribute the comparative poverty of the avifauna chiefly to the geographical position of the county, which not only lies east of the fly-line between Scotland and Anglesea viâ the Isle of Man, but (as they hold) east of the route between Lancashire and the Welsh coast, for in migrating movements observed at the Dee Lightship (presumably off the Point of Air in Flintshire) the route taken by the passing birds was N.E. or S.W. 'The number of resident species also would, no doubt, be larger were there a rocky coast line.'

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The western portion of the county having been previously treated of by Brockholes in 1874, and Dobie in 1893, in 'The Proceedings of the Chester Society of Natural Science,' Parts I. and IV., which the authors quote from freely, we have examined with special interest the records from the eastern part, with regard to which no systematic list has hitherto been published. Here in the plain are most of the large meres 'pre-eminently the home of the Great Crested Grebe, the Coot, and Reed Warbler.' The notice of the first of these is one of the most interesting in the book; we are delighted to learn that on many of these waters from one to half-a-dozen or even more pairs nest every year, and that this handsome species is found in greater numbers in Cheshire than in perhaps any other county of England. Here, too, lie the 'Highlands' of Cheshire, consisting of an outlying portion of the Peak country, the home of the Red Grouse, and the breeding ground of the Snipe, Curlew, Golden Plover, and Ring Ousel; here the Merlin and Twite still nest, and 'small trips of Dotterel are seen almost every year in May and June,' while in the upper valleys of the Dane and Goyt the Woodcock breeds. Here we note also the Lesser Whitethroat is absent, though fairly common in the west.

Turning to the county generally, we learn that the Lesser Redpoll is fairly common, the Nuthatch rare and very local, the Pied Flycatcher a rare passing migrant; the Goldfinch and Linnet are decreasing, while the Hawfinch and Turtle Dove are becoming more common; the Siskin is a scarce winter visitor; the Wryneck and Woodlark are very rare. Amongst species which have occurred once we note the Blue-headed Wagtail, Nutcracker, Scops Owl, Purple Heron and Night Heron, while the Little Bittern and Spoonbill have each been met with twice and the Osprey three times. Many reported occurrences are regarded as 'not proven,' notably the Noddy Tern, and all, we think, on good grounds, but surely Sabine's Gull, a single specimen of which 'was obtained on the Welsh side of the Dee estuary,' is hardly entitled to a place among the birds of Cheshire.

An interesting and critical account is given of a duck-decoy worked in the seventeenth century by Sir William Brereton at Dodleston, and an attempt made to identify the spot with a farm on the road between Dodleston and Chester still known as the 'Decoy Farm.'

A study of the volume suggests to us that further observations would be valuable on such points as the distribution of the

Lesser Whitethroat, the occurrence of the Nightingale evidenced by the discovery of a nest, the status of the Woodlark in the county (for we have seen eggs taken in Cheshire which we thought were of this species), the presence of the Velvet Scoter amongst flocks of the Common Scoter off the shores of Wirral (suggested as probable by the authors), and more evidence of the occurrence of the Bearded Titmouse.

We hope that Cheshire bird lovers, guided and encouraged by such an excellent text book, will become more keen and more competent observers in the future, and will not fail to chronicle their observations. The pages of 'The Naturalist' are open to them. W. H. Dobie.

NOTE—ORNITHOLOGY.

Voice of Cuckoo.—Have our readers noticed that the Cuckoos (*Cuculus canorus*) have kept in full song up till now, 7th July. As a rule long before this they begin to stutter and have great difficulty in uttering their cry. In 1898, on the 6th July, they were giving us six cucs to one coo. The lateness of the season seems to have affected their song, although I did not notice that they arrived later than commonly. I have only seen one egg this season as yet. This was in a Yellow Wagtail (*Motacilla rayi*)'s nest in a field at Yaddlethorpe, a noted place for them in my young days.—Max Peacock, The Manor, Bottesford, Lincolnshire, 7th July 1900.

NOTES—LEPIDOPTERA.

***Colias hyale* and *C. edusa* near Spilsby.**—I caught a fine specimen of *Colias hyale* this morning near here, and saw about eight specimens of *C. edusa*.—J. C. Lane-Claypon, Aswardby Hall, Spilsby, Lincolnshire, 20th August 1900.

***Colias edusa* near Lincoln.**—At 11.45 a.m. on Friday, 17th August, at Waddington, on the high road from Lincoln to Grantham, I saw an apparently freshly-emerged male example of *Colias edusa*.—A. E. Hall, Norbury, Sheffield, 21st August 1900.

Hummingbird Hawkmoth at Ripon.—This lovely moth (*Macroglossa stellatarum*) was seen in my garden on Tuesday evening, 24th July, curiously enough the same date as your Milnthorpe correspondent mentions he had seen it. It is quite three or four years since I have noticed one of the species here. I have watched in vain for it since, but have not seen it.—Horace St. Paul, The Willows, Ripon, 3rd August 1900.

Hummingbird Hawkmoth in Westmorland.—Last month's note on *Macroglossa stellatarum* was interesting, for this is the first year in my (somewhat short) experience of the county in which it has been seen. It must be fairly plentiful. Since 11th July it has been in the garden pretty often; I have seen it in Grasmere, and friends have had it in Ambleside. When first it came, almost all the flowers, except roses, seemed to yield it nectar—pinks and pansies and the last blooms of aubretia. But on 21st July, when the grand early-flowering white phlox—whose heads of flowers measure nine inches high of dense bloom—was open, the moth was entirely absorbed with it, pausing to pass its long tongue down the long flower-tubes over and over till, apparently satisfied, it flew far away.—Mary L. Armitt, Rydal, 3rd August 1900.

NOTE—COLEOPTERA.

Coleoptera taken at Bottesford, Lincolnshire.—The following species have been taken by me on or about 21st May 1900, and named by the Rev. A. Thornley:—

Hydrobius fuscipes.	*Bembidium quadrimaculatum.*
Geotrupes stercorarius.	*Bembidium littorale.*
Necrophorus humator.	*Ilybius obscurus.*
Carabus monilis.	*Gyrinus natator.*
Pterostichus vulgaris.	*Hyphydrus ovatus.*
Pterostichus cupreus.	*Pyrochroa serraticornis.*
Harpalus tardus.	*Telephorus lividus.*
Calathus cisteloides.	*Helophorus aquaticus.*
Anchomenus albipes.	*Laccobius minutus* (Linn.).
Amara livida (*bifrons*).	*Phyllobius oblongus.*
Amara familiaris.	*Hydroporus lituratus.*

—Max Peacock, Bottesford, 12th July 1900.

NOTE—GEOLOGY.

The Marlstone at Lincoln.—I was pleased to find from the report of the excursion of the Lincolnshire Naturalists' Union to Lincoln, published in 'The Naturalist' for August, that the geologists present at that excursion paid particular attention to the evidence in favour of the presence of the Marlstone at Lincoln.

The Marlstone proper should occur in the zone of *Amaltheus spinatus* at the top of the Middle Lias; and the fact that Mr. W. D. Carr, the officers of the Geological Survey, and others have failed to detect it, would seem sufficient reason for the belief that this particular bed does not occur at Lincoln. Mr. J. H. Cooke, F.G.S., in a paper in the 'Geological Magazine,' 1897, pp. 253-259, 'On a New Section in the Middle Lias of Lincoln,' pointed out that he had obtained from a bed in the Lias at Lincoln '*Rhynchonella tetrahedra*, which would seem at once to determine its equivalence with the Marlstone, that has hitherto been supposed to have been missing in this neighbourhood.' Were this statement substantiated, Mr. Cooke has certainly added an item to our knowledge of the Lincoln Lias. From the report of the Lincolnshire Naturalists' Union referred to, it would appear that Mr. Cooke's determination rests 'upon the fragment of one shell which appeared to him as *Rhynchonella tetrahedra*.' This certainly seems slender evidence upon which to base such a new and important conclusion. If the fragment be still in existence it would be satisfactory to have it examined by an expert; the result might just possibly be that it was not *R. tetrahedra* at all; but provided that Mr. Cooke's determination be correct, the occurrence of *R. tetrahedra*—as Mr. Cooke will be aware—does not of itself prove the presence of the Marlstone or zone of *Amaltheus spinatus*, as that Brachiopod occurs also in several other zones of the Middle Lias. From several days' collecting amongst the fossils of the Lias at Lincoln in 1898, I have arrived at the conclusion that the species hitherto referred to as *Am. spinatus* is more probably *Harpoceras algovianum* Oppel, and which is characteristic of the zone of *Am. margaritatus*. I am therefore inclined to think that the Marlstone of the *Am. spinatus* zone does not occur at Lincoln at all, but that the whole of the beds in question belong to the zone of *Am. margaritatus*.

In conclusion it would appear that Mr. Cooke's evidence is very dubious. The presence of *R. tetrahedra*, if verified, does not prove the presence of the Marlstone; and as the previous identification of *Am. spinatus* seems to me doubtful, the whole case in favour of the presence of the Marlstone at Lincoln falls to the ground.—F. F. Walton, 19, Charlotte Street, Hull, 25th August 1900.

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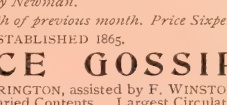

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I PROPOSE in this paper giving the most interesting Mosses collected at the meeting of the Yorkshire Naturalists' Union, 4th August to 6th August 1900. The time was too short to do anything like justice to the moss-flora of such an interesting dale, and, as the members present know only too well, the conditions for gathering were rather too moist even for a bryologist, who grows to love moisture and its effects.

On a future occasion I hope to send a complete list of the mosses, both common ones and rare ones.

En route to Farngill, *Dicranoweisia cirrata* Ldb., crowded with fruit, was frequent on the wall tops; also *Hypnum uncinatum* Hedw. By the banks of the gill, *Amblystegium filicinum* DeNot. was very abundant, forming extensive patches, but nowhere in fruit. This is by far the most abundant moss in Arkendale. Its frequent companions *Hypnum commutatum* and *Hypnum falcatum* were also very abundant and conspicuous, but only a little fruit was found on the former. Higher up the gill I found a beautiful, dwarf, and vivid green variety of *Weisia rupestris* covered with capsules. This is probably a new variety, as it is different from the very many specimens of *W. rupestris* I possess. Close by I was pleased to find the rare *Grimmia affinis* Lindb., the *Rhacomitrium heterostichum* var. *alopecurum* Hübn. of Dixon's 'Handbook of British Mosses.'

At the head of the gill I traversed extensive tracts of moorland and nowhere saw any deep *Sphagnum* swamp. It was interesting to compare the shallow sheets of the bog-mosses with the thin strata of coal that Mr. Goodchild pointed out exist now under the surface. On this moor I found a long growth of the rare moss *Hypnum stramineum*. One shallow pool was covered with *H. fluitans* var. *falcatum* Schp., the true '*falcatum*,' so easy to mistake for other mosses until properly understood. There was no fruit, whereas in a similar pool on the top of Burnhope Seat, in Durham, I found one mass of capsules in July 1898. The Sphagna observed were all the common ones—*Sphagnum cuspidatum*, *S. intermedium*, *S. acutifolium*, and *S. papillosum*—except one, which has still to be determined.

At the foot of the highest ridge of the limestone cliffs, between Farngill and Reeth, I found a moss new to Yorkshire, viz., *Grimmia montana* B.&S. It grows in small, round, flat, black patches on the large boulders at the foot of the cliff. Mr. Bagnall confirms my naming.

I was interested to see *Neckera crispa* var. *falcata* Boul. on the same cliffs, and our geological friends may take it that this is a strong proof that the cliffs are limestone, if any other proof were needed. I have found the same moss on the Hambleton Hills, Kilburn, and in the Jackdaw Crag Quarry, Tadcaster, and I imagine the moss would not appear on anything but limestone. Another interesting moss of Farngill is the vivid green one *Leptodontium flexifolium* Hpe., my first find of this moss.

On the second day Hellwith produced for me *Eurhynchium crassinervium* B.&S., a rather rare moss, but which we meet with oftener in Yorkshire than elsewhere. It is identical with the same moss that I gathered at the Strid, Bolton Woods, and behind Hardraw Scaur, Hawes. In a fast stream on Hurst Moor I found the rare moss *Fontinalis squamosa* L., and in the best condition, for it is in rich fruit, a very rare condition to be in. Surely the *fast* stream under which it was submerged could not have been the normal condition. No doubt *after* fruiting the moss became submerged by the swollen stream caused by the recent heavy rains.

In the same stream a small-leaved and chocolate-brown form of *Hypnum ochraceum* is quite at home. Its companions are *Brachythecium rivulare* and *Dichodontium flavescens* Ldb.

On the third day in Little Punchard's Gill ravine, in spite of the heavy rain, I was able to find some interesting mosses, and two not hitherto recorded. My chief finds here were:—*Weisia rupestris,* in abundant fruit; *Polytrichum alpinum* L. c.fr.; a very tall growth of *Zygodon Mongeotii* B.&S.; *Plagiobryum Zierii* Ldb. c.fr.; *Orthothecium intricatum* B.&S., the large leaved, and well-developed condition; *Plagiothecium pulchellum* B.&S., in nice fruit; *Hypnum ochraceum* Turn., with abundant ♀ flowers, but no capsules formed. *Dicranella heteromalla* var. *interrupta* B.&S., a new record, on a ledge close by a waterfall. *Eurhynchium murale* var. *complanatum* B.&S., a new record, on a ledge near a waterfall in the upper part of the gill. Except for the green apices of the stems, the whole moss was steeped in the finest black dust. It is a beautiful and distinct variety, quite different in areolation, in branching, and habit from type. Mr. Bagnall confirms my naming.

Naturalist,

I regard Little Punchard's Gill as quite a treasure house for rare mosses, if only time can be found to work it. The results of two hours' work there are quite satisfactory. Little Punchard's Gill and Ravine are much like the Ireshope Burn and Clints, in Weardale, both being of limestone, and, as far as worked, the mosses are very similar, but in Weardale the mosses are mostly rich in fruit, whereas in Punchard's Gill they are mostly barren. This is caused no doubt by the gill being more in a hurry than the Ireshope Burn, and having little opportunity of spreading over its banks, being, in addition, more confined by the nearer approach of the cliffs on either side.

I am much obliged to Mr. Bagnall for his kind additional aid in the case of the more critical mosses mentioned in this paper.

NOTE—CONCHOLOGY.

***Vertigo angustior* in Lincolnshire.**—On the 27th of July I received this addition to the fauna of Lincolnshire from Mr. C. S. Carter of Louth, specimens of this species having been found by him on 16th July at the roots of grass on a sandbank in the warren at North Somercotes, in company with *V. edentula* and *V. pygmæa*.—Jno. W. Taylor, Horsforth, 18th Sept. 1900.

NOTE—ANTHROPOLOGY.

Neolithic Implements near Louth.—As there appear to be no records for Louth district of Neolithic implements, the following may be of interest. Since May 1899 I have found arrow-heads, scrapers, and abundance of flakes of rather crude workmanship at Kelstern Grange. From their number and character I am of opinion there existed an early Neolithic Settlement. I have also found some good flakes near Goulceby. In June last I found near Stewton a fine polished stone implement, measuring 4¼ inches in length, 2½ inches wide at the broad end; it is of adze type. —C. S. Carter, 172, Eastgate, Louth, 11th September 1900.

NOTES—PALÆONTOLOGY.

Mammoth's Tooth at Robin Hood's Bay.—Mr. Ed. Storm, of Fyling Thorpe, some time ago gave me part of a large tooth which he had found on the beach at Robin Hood's Bay many years before. I assumed that it was the tooth of an elephant brought home by a sailor and lost, but Mr. Thomas Sheppard points out that it is part of a tooth of a Mammoth (*Elephas primigenius*). It is in good preservation, and was doubtless derived from the boulder-clay. So far as I have been able to ascertain, this is the most northerly record of its occurrence on the Yorkshire Coast.—Herbert B. Muff, Heaton, Bradford, 12th September 1900.

Red Chalk Fossils at Redhill, near Goulceby, Lincs. N.—In addition to the lists of Red Chalk Fossils in the Geol. Survey Memoir (East Lincs.) and White's Lincs., the following have been found in situ at Redhill, near Goulceby:—A Polyzoon (*Cyclocyathus fittoni*?), *Terebratula semiglobosa*, with a small Polyzoan rooted upon the dorsal valve, piece of Pentacrinites stem, *Rhynchonella* (2 specimens), a curiously deformed *Belemnites* and 'Sponge' similar to *Ventriculites*.—C. S. Carter, 172, Eastgate, Louth, 11th September 1900.

NOTES—LEPIDOPTERA.

***Colias hyale* at Bridlington.**—Mr. A. Jordan, of this town, brought me to-day a specimen of *Colias hyale*, captured by him at Bridlington during last August.—H. H. CORBETT, 9, Priory Place, Doncaster, 21st Sept. 1900.

Clouded Yellow Butterfly at Ripon.—Several specimens of the Clouded Yellow (*Colias edusa*), a rare butterfly in the Ripon district, were found in August 1900, on the railway embankments near that city.—J. W. FAWCETT, Satley, Darlington, 19th September 1900.

***Colias edusa* and *C. hyale*, etc., near Beverley.**—On the 18th of August I saw a specimen of *Colias edusa* on the Newbald Road, Beverley, but could not catch it. Since then I have taken fifteen specimens of this somewhat rare insect and have heard that several others have been taken. On the 25th of August I took a specimen of *C. hyale*, also on the Newbald Road. *Vanessa cardui* has been unusually abundant this season, and I have taken several specimens of *V. io*.—J. R. LOWTHER, Crane Hill, Beckside, Beverley, 17th September 1900.

***Colias edusa* in the Isle of Man.**—On 4th September of the present year I caught a fine male *Colias edusa* flying in the hot sunshine at midday along the high road at Ballasalla, near the south-eastern extremity of the island. On the 6th I observed two other specimens on the wing in the north of the island, one at Jurby, and the other near to Ballaugh.

In all parts of the island I could not avoid remarking the great prevalence of the Wall Butterfly (*Satyrus megæra*), which is so uncommon a species with us in the West Riding.—SYDNEY V. TAYLOR, North Grange, Horsforth, 14th September 1900.

Death's Head Moth in Cumberland. On Sunday, 26th August 1900, the caterpillar of a Death's Head Moth (*Acherontia atropos*), 4½ inches in length, was found on a nettle near a potato patch in a garden at Netherton, Maryport.—J. W. FAWCETT, Satley, Darlington, 21st September 1900.

Death's Head Moth in Lake-Lancashire.—Several specimens of the larva of *Acherontia atropos* have been found lately in the Ulverston district, how many I do not know. Of the three of which I am aware, one is in my possession. When given to me on 29th August it was in poor condition and in a mustard tin. Want of food or excess of mustard made it very uneasy, and it buried itself on 31st August, but it was not, to my mind, full fed.—S. L. PETTY, Ulverston, 3rd September 1900.

Death's Head Moth in Ripon City.—During August 1900, two specimens of the Death's Head Moth (*Acherontia atropos*) were found in Ripon—one in Princess Road, and the other in Stonebridgegate. Both were in the caterpillar state, the former being found on a potato leaf. This is the first time the discovery has been made in Ripon, the previous instances of the appearance of this rare moth having been recorded at Aldfield and Marton-le-Moor, near Ripon.—J. W. FAWCETT, Satley, Darlington, 19th September 1900.

Death's Head Hawkmoth in Notts.—It looks as if this moth (*Acherontia atropos*) is going to be common this year. I received a living specimen on the 23rd of June, and I note Mr. Hey's was taken on the 25th. At first I suspected it was a case of hybernation, but a little correspondence with Mr. Barrett convinced me that after all it represents the normal life-history of the insect. That is to say, the eggs are laid sometime in June or July, when the potato tops are in prime condition for the attack of the larva, which can now be found full fed. An example I possessed went to earth last Friday (July 27th). I suspect the normal period of pupal life is through the winter and spring, the moths emerging in July. Collectors are so given to forcing the pupæ of these grand moths that the normal life-history becomes obscured.—ALFRED THORNLEY, South Leverton Vicarage, Notts., 2nd August 1900.

THE CHEMISTRY OF SOME LAKELAND SHRUBS AND BUSHES.

P. Q. KEEGAN, LL.D.,
Patterdale, Westmorland.

WHILE, as everybody knows, a tree is a woody plant with a single simple stem which attains a height of some twenty-three feet at least, a shrub is a plant with a stem branched from the base and less than twenty-three feet high, or one about the same height and naked at the base may be called a bush. How it comes to pass that certain forms of plant develop into trees, while certain others, closely allied thereto, stop short at the shrub or bush stage, need not be discussed here. A searching examination of the physiological needs, characters, etc., incident to each of these structures and forms of vegetative activity would doubtless reveal the cause more or less satisfactorily; but what I propose to solicit special attention to in this paper is the extremely varied and eminently interesting chemical products of shrub life. In many signal instances there is assuredly something 'strong' about them; that is to say, while the vigorous and stalwart giants that people the forest put forth ordinarily healthy products as a matter of course, many of our shrubs and bushes evolve such a plethora of such substances as alkaloids, bitter principles, etc., as to arouse the suspicion that the stream of their vital energy is sometimes and somewhat sullied by disease.

Shrubs and bushes of divers sorts are fully and vigorously represented in Lakeland, and although one or two of the species about to be described may be regarded as trees rather than otherwise, there is, as is well known, a distinctly marked tendency as they ascend into the hills to acquire a certain number of characteristic modifications, to assume new and specially adapted anatomical features and corresponding functions, and generally to become dwarfed in habit and changed in composition. I will commence with a rather special item, bearing a familiar name, viz., the common

Juniper. ***Juniperus communis.*** This plant is not, I think, the theme of any special song by any of the local poets, but it is scientifically interesting to a degree. It is of extremely slow growth and lives very long; its leaves last four years. During

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the winter the starch disappears completely from the bark, but not so from the wood; the latter has no tannin, but has much coniferin, and some terpene and free phloroglucin in certain cells. The bark is rich in mucilage and encloses a phlobaphenic tannin which precipitates gelatine, etc., and it is highly remarkable, and in our clime almost unique, that its lowest anhydride (identical with the soluble red pigment of certain flowers) is found free in this part of the organism; there is also a higher phlobaphene, a bitter principle, but, strange to say, no resin. The leaves are characterised by a lavish accumulation of white crystalline wax, with very little fat (in summer) or carotin, much sugar, not much mucilage or starch, but considerable rutin, tannin, and quinovic acid, with some free phloroglucin and phlobaphene. The berries are wonderfully familiar in sound and otherwise to many non-botanists; their official analysis is somewhat as follows:—29·4 per cent. water, 5 albumenoids, 29·65 sugar, 0·73 pectin, 15·83 cellulose, 0·64 wax, 9·6 resins, 0·37 juniperin, 1·73 (unripe) and 0·34 (ripe) volatile oil, which is a mixture of hydrocarbons $C^{10}H^{16}$, 3 acids, and 2·33 ash. The whole dried bush burned yields only 4 per cent. of ash, a fact which goes far to explain why it is that 'these barren rocks are sprinkled o'er with fern and juniper.'

Yew. ***Taxus baccata.*** The sombre, melancholy Yew, whose 'protruded boughs darken the silver bosom of the crag,' etc., grows with excessive slowness, yet is of a delicate temperament, and decidedly shade-enduring. The bark never encloses resin-reservoirs or canals, but in other respects is not unlike that of other conifers. The highly compact and tenacious wood is also devoid of resin-canals, and its moderate starch-content does not completely disappear during the winter; it bears a little tannin in the heart, and a moderate amount of coniferin throughout. The leaves are thoroughly plastered with wax, and have some fat and moderate carotin, a phlobaphenic tannin, some volatile oil and brown terpene, free phloroglucin, and pectous and 'humus' matter; in August I found in the dried leaves only 4·8 per cent. ash rich in potass, silica, and manganese, and on 8th September an abundance of starch was detected. Perhaps the most remarkable constituent of the young shoots and leaves is an alkaloid called taxine which, according to some observers, occurs chiefly or entirely in the male plant, but at all events it is the older and deeper coloured leaves that are said to be the more poisonous, e.g., to cattle; it is colourless, amorphous, nitrogenous, has a musty odour, and

exerts a powerful action over the heart and arteries. The red colouring matter of the arillus is insoluble in water, and is due to homogeneous plastids tinctured by an ally of carotin.

Elder. ***Sambucus nigra.*** The wood of this shrub is very heavy and hard, difficult to dry, and is specially eminent for its richness in starch and coniferin in all seasons, its freedom from tannin and phloroglucin, and its very slight reducing properties. The bark is remarkable for the easy and rapid production of true cork (suberin) as distinguished from the hard rhytidome of most of our trees and shrubs; it contains a very small quantity of an iron-greening phlobaphenic tannin and some free phloroglucin, also choline and valerianic acid. The leaves contain much chlorophyll, carotin, and wax, but only a little fat, also rutin and tannin, but not much mucilage, and about 7·5 per cent. of ash. The flowers enclose 0·3 to 0·5 per cent. volatile oil, which contains limonene $C^{10}H^{16}$, also an acrid resin, rutin, mucilage, and malates, but no tannin. The berries contain a sudorific substance, gum, sugar, and malic, but no citric, acid; the deep red pigment is highly developed, yielding blue precipitates with alkalies and with acetate of lead.

Ivy. ***Hedera helix.*** Who has not marked 'the green of ivy, flourishing and thick, that clasps the huge round chimney,' etc., or when round some ancient elm, etc., 'it twines in grisly folds and strictures serpentine!' Let me observe that it is not a vegetable parasite, as it draws nothing from the tree, which, however, it injures both mechanically and physiologically by being utilised as its support. The wood, so remarkable for its numerous vessels and large medullary rays, examined on 15th August was found extremely rich in starch (the rays being packed full with large granules), globules of resin occurred near the cambium and in the pith, there was a considerable amount of coniferin, but no tannin or phloroglucin, and but little glucose. The bark contains a small quantity of a tannin (viridinic acid), also a peculiar resinous glucoside (hederine) allied to saponin; it has an acrid taste, froths when boiled in water and dissolved in sulphuric acid with brown colour passing to a splendid purple. The leaves contain much white wax, some fat, but comparatively little carotin, a large amount of rutin (which is converted into tannin and erythrophyll during the winter), also hederine, and much oxalate of calcium; there is not much starch in summer apparently, and none at all in winter; on 16th August I found the amount of ash in dried leaves which had been growing on a stone wall to be 4·5 per

cent., with about 45 per cent. carbonate of lime and 22 silica. The alliance of the Ivy with the Umbelliferæ is strikingly demonstrated by the results of the chemical analysis.

Apple. ***Pyrus Malus.*** This bush is frequent in the Lakeland hedges and thickets, ascending to 900 feet. The blossoming is redundant in most cases, although the fruit is harsh, crabbed, and austere. The chemistry is of highly remarkable and quite unique interest. The wood has much starch, phloroglucin, and glucose. On 15th November I found that the pith cells were still full of starch, although it had vanished completely from the bark. The latter contains a tannin identical with that of the Horse Chestnut, also free phloroglucin, and up to 5 per cent. of a highly remarkable and extremely well defined glucoside discovered in 1835 by De Koninck and Stas and named phlorizin, $C^{21}H^{24}O^{10}$; its chemical constitution is not certainly known, but it belongs to or is hydroxy-phenylpropionic acid; it tastes sweet with bitter after-taste, is crystalline, and when its aqueous solution is boiled with nitrite of potassium and sulphate of zinc a blue or violet colour is produced, also when it is moistened with ammonia in the air it turns orange, red, and finally dark blue; it is evidently a direct decomposition product of albumenoid. The leaves have much carotin and white wax, but very little fat or resin; what is remarkable is that little rutin or tannin can be detected, their place being usurped by phlorizin; much proteid, malate and oxalate of calcium, considerable starch, and about 7 per cent. of ash containing much lime and little silica. The fruit remains in a condition of chronic unripeness, i.e., it contains much starch and some cane-sugar and levulose along with free acids and tannin, but the fermentative oxidising processes are not powerful enough to exhaust the starch, to produce a sufficiency of sugar, or to completely burn up the acids and tannin.

Bird Cherry. ***Prunus padus.*** The chemistry of this bush is qualitatively very similar to that of the Wild Cherry (see 'The Naturalist,' No. 522, July 1900, p. 217), with, however, the very important and peculiar difference incident to the presence of the well-known nitrogenous glucoside amygdalin, $C^{20}H^{27}NO^{11}$, accompanied by its special ferment emulsin. '*Prunus padus,*' says Wicke, 'appears impregnated with amygdalin, all the organs contain it.' Another feature is that the flowers, when distilled with dilute solution of soda or lime, yield a distillate charged with trimethylamine—a decomposition product, it is

supposed, of lecithin, which occurs chiefly in the petals and in the pollen, and is transferred thereto from the leaf viâ the pedicel; it seems to result from the hydrolysis of a proteïd of the vitellin group, and supplies another illustration of the somewhat morbid tendency not unfrequently observable in the magnificent order Rosaceæ.

Hawthorn. ***Cratægus oxyacantha.*** The chemistry of this bushy shrub may be regarded as indicative of something intermediate between the two aforesaid species of Cherry. Thus the flowers contain lecithin and, in addition, a powerful volatile oil and resinous substance, whose odours, intermixed with the decomposition product of the former, produce a distinct ammoniacal bouquet. Again, amygdalin occurs here also, but only in the buds and young shoots, from which it disappears in time, the adult plant no longer containing it. It is singular that the young leaves contain very little or no rutin, also that the haws should contain much starch, and their red pigment is soluble (anthocyan), though not fully developed, inasmuch as it yields a green and not a blue precipitate with acetate of lead. The fresh bark of the young branches contains a very bitter and ill-defined substance indicative of that Rosacean decomposition and impurity to which I have already adverted.

Holly. ***Ilex aquifolium.*** Another instance of slow vegetation and prolonged life. The state of affairs within the hard and heavy homogeneous wood may be gleaned from my notes:—'May 11; much starch in pith, medullary rays and wood parenchyma, no resin or fat, no phloroglucin or glucose, has iron-greening tannin and a little coniferin.' There are some interesting peculiarities about the bark; it contains ilicene, a hydrocarbon $C^{36}H^{60}$, which is combined with a fatty acid, a tannin which resembles caffeetannin, but it precipitates gelatine and does not yield caffeic acid by the action of alkalies; also a viscid substance (probably a compound or mixture of pectin and ilicene) which is separated by bruising the bark and leaving it to ferment for a fortnight in a damp place, then washing with much water; if the residue be now mixed with walnut oil, the well-known 'bird-lime' is obtained, well fitted to ensnare the winged tribe. The analysis of the 'wrinkled, keen, and glossy' leaves is difficult on account of the especially strong development of the cuticle; in August there is much fat and wax, but little carotin, some resin and rutin, much reducing sugar, a gelatinous substance precipitable by acids, very much oxalate of calcium, but only about 4·5 per

cent. ash. The berries are violently purgative, and contain acids, sugar, pectin, tannin, etc., and it is especially noteworthy, moreover, that the brilliant coral red of the epicarp, that so cheers the festal soul at Christmas time, is not due to carotin, but depends on the gradual but thorough oxidation of the tannin which, being non-phlobaphenic, supplies as chromogen an especially pure and brilliant pigment.

NOTES—FLOWERING PLANTS.

***Schœnus nigricans* in Lincolnshire.**—It may interest Mr. Corbett to hear that in low-lying bogs in Lincolnshire this plant is not very uncommon. I have myself gathered it in Crosby Warren and on Scotton Common, and I believe in other like places. It is also recorded for Norfolk, Suffolk, Cambridge, Bedford, Hunts, etc., in none of which counties can it occur at any great height above sea level. It seem to me more likely that it has been overlooked at Askern than that it has 'only lately come there,' as it can hardly be called a conspicuous plant except by those who are as enthusiastic plant-hunters as Mr. Corbett is. Many, even if they saw it, would say, 'one of the sedges,' and pass on.—W. FOWLER, Liversedge, 3rd September 1900.

Interesting Finds in a Town Garden.—It is my misfortune or otherwise to live in the midst of a densely-populated town parish, the atmosphere of which cannot be said to be particularly favourable to plant life. And yet, in my town garden, of no great size, the following interesting species have spontaneously made their appearance :—

Solanum nigrum Linn.
Stachys arvensis Linn.
Polygonum aviculare Linn.
var. *rurivagum* Jord.
Panicum Crus-galli Linn.
Setaria viridis Beauv.
Poa compressa Linn.

The *Panicum* I have found to-day; it is the first time I have made its acquaintance.—W. WRIGHT MASON, St. Mary's Parsonage, Bootle, Liverpool, 6th September 1900.

Sedbergh Plants.—I have been teaching a few young ladies this summer, including some pupil teachers in elementary schools, etc., and they (the Brigflatts Botanical Class) have noted this season the following plants, some of which are aliens or casuals, but they are nearly all new to them and interesting :—

Thalictrum alpinum (Alpine Meadow Rue) was given to them by an expert Alpine climber from an almost inaccessible ledge or crevice on the grand old Cautley Crags. He also gave them at the same time *Sedum fabaria* (Narrow-leaved Orpine).

Sisymbrium orientale (Hare's Ear Mustard) was found on the railway near Sedbergh Station.

Hypericum elodes (Marsh St. John's Wort) is growing in our bogs on Longstone Fell.

Geranium pyrenaicum (Pyrenean Crane's-bill) was seen in driving by the Lune, and a very fine specimen got from the road-side.

Lathyrus sylvestris (Narrow-leaved Everlasting Pea) was growing among the corn at Brigflatts; it has insignificant flowers.

Galeopsis ochroleuca (Yellow Downy Hemp Nettle) is a small but very handsome plant, with its two long yellow flowers.

Mentha gentilis (Bushy Red Mint) grows at the bottom of a wet hedge bank, almost on the sandy road.

Linum perenne (Perennial Flax), *Polygonum fagopyrum* (Buckwheat), and *Sedum reflexum* (Crooked Stonecrop) were all growing in or near an old farmyard.—JOHN HANDLEY, Brigflatts, Sedbergh, 20th September 1900.

NOTE—FLOWERING PLANTS.

Lincolnshire Aliens: Grimsby.—Among some other plants received from Grimsby (Div. 4), from Mr. A. Smith, I found:—

Lepidium sativum.
Lepidium ruderale.
Lepidium Draba.
Chenopodium pseudo-botryoides.
Chenopodium album, vars.
incanum, viride, and *viridescens.*
Chenopodium vulvaria.
Fœniculum vulgare.

And a number of other aliens I have no books to name from.—E. Adrian Woodruffe-Peacock, Cadney, Brigg, 14th August 1900.

NOTE—FUNGI.

Large Fairy Rings at Fillingham Castle, Lincs.—All of us know the 'fairy rings' so common in our meadows and grass lands, and many of us have ventured to eat the fungus—*Marasmius oreades*—which causes them.

On the 8th of August last, some of the largest 'fairy rings' I ever saw, or heard of, were pointed out to me in the grounds of Fillingham Castle, about 10 miles north of Lincoln, on the cliff.

This fungus owes its generic name, *Marasmius,* as the Rev. W. Fowler, of Liversedge, tells me, to the power it has of shrinking with drought and reviving again with moisture; on which account, he says, 'it can be hung up on a string in the kitchen, and used for flavouring at any time when wanted.'

I do not know whether the 'ring' I am speaking of was the largest of those I saw, for there were several, apparently as big, around the place, but the one I measured (by stepping) was 86 yards in diameter. The circle was nearly round, only broken a little on one side by a path running through the park.

I shall be glad to hear if it is a common thing for 'fairy rings' to attain such a size as this. Perhaps some of your readers will throw light on it. —F. M. Burton, Highfield, Gainsborough, 21st September 1900.

NOTE—MARINE MOLLUSCA.

***Acmæa testudinalis* in Grace Darling's Collection.**—It is not, I think, well known that England's famous heroine, Grace Darling, was a conchologist—a collector of marine shells, at any rate; but recently, Mr. John E. Robson, of Hartlepool—whose name by rights should foot this note—informed me that the courageous girl's collection is extant and intact—in Newcastle, I believe—and that in it lies a specimen collected on the Farnes of that rarer of our two Limpets, *Patella testudinalis*, a gastropod that has not as yet found a place in a much desiderated complete list of the marine and freshwater shells of Northumberland with Durham.—F. Arnold Lees, Leeds, 7th August 1900.

In reference to this matter, our good friend Mr. Richard Howse, M.A., the curator of the Museum at Newcastle-on-Tyne, writes me that Grace Darling's collection was bequeathed to the museum by her sister many years ago, and is arranged in the Central room, open to public inspection. It includes about thirty specimens of this species. As these were collected before Grace left the Longstone Lighthouse, they are undoubtedly the first collected on the North-East Coast. The record has already been published, as Mr. George Tate included it in a list of the Farne Islands Mollusca in 1859 (Berwicksh. Nat. Club Transactions), which was undoubtedly drawn up from Grace Darling's collection. Mr. Howse has since that date found the shell along the coast from Newbiggin to Hartlepool in 1865, and at Staithes about the same date. Since then Mr. H. Crowther has found it near Whitby, and Mr. Butterell at Flamborough, which now stands as the southern limit of its range on our east coast.—W. Denison Roebuck, Leeds, 4th September 1900.

NOTES—LEPIDOPTERA.

Hummingbird Hawkmoth at Lincoln.—On the 18th July last, I saw one Hummingbird Hawkmoth (*Macroglossa stellatarum*) hovering over a scarlet geranium bed in the Lincoln Arboretum. Since then I have seen no others.—J. EARDLEY MASON, 34, Chaplin Street, Lincoln, 4th Sept. 1900.

Hummingbird Hawkmoth at Tow Law, Co. Durham.—During each sunny forenoon for a month, from the middle of July to the middle of August of the present year, a specimen of the Hummingbird Hawkmoth (*Macroglossa stellatarum*) has been observed hovering over flowers in the garden of the Vicarage at Tow Law.—J. W. FAWCETT, Satley, Darlington, 19th September 1900.

Hummingbird Hawkmoth at Hull.—I saw during the recent hot weather a very fine specimen of this interesting moth (*Macroglossa stellatarum*, figured by Donovan, Plate CLV.) often flying in and out of my drawing-room window and feeding on the flowers of two or three small white Campanula plants on a table *inside* the window. Specimens had been seen several times before in my flower garden.

At page 66 of his 'Lepidoptera Britannica,' 1803, my grandfather (A. H. Haworth) wrote:—'This species frequents gardens, flying in sunny weather between the hours of ten and twelve in the morning and those of two and four in the afternoon. Its food is the nectarious juice of tube-bearing flowers.'—B. B. HAWORTH-BOOTH, Hullbank Hall, Hull, 9th August 1900.

Death's Head Moth at Horsforth, Leeds.—I have to-day had a living specimen of the Death's Head Hawkmoth (*Acherontia atropos*) that was caught at Horsforth last night; it flew into the house in the evening, and Mrs. Gaunt's attention was first drawn to it by the cat trying to catch it. It is a very fine specimen.—ALFRED WHITE, 44, Albion Street, Leeds, 31st August 1900.

Extraordinary Abundance of *Pyrameis atalanta* at Maltby.—The sunny rides in Maltby Wood are swarming with this beautiful insect. Every patch of *Scabiosa succisa* has its group of Admirals. Along with them are many *Plusia gamma*, but no other species of butterfly. I visited the wood twice last week and could have taken hundreds of *P. atalanta* without any difficulty.—H. H. CORBETT, 9, Priory Place, Doncaster, 21st September 1900.

Some Notes upon Early Lepidoptera: *Pyrameis atalanta*.—Some of your correspondents have been recording the early appearance of Red Admirals (*Pyrameis atalanta*). They fail, however, to note the important point, whether they may not have been hybernated examples. I have seen examples of this species flying frequently during June, but as far as observation could tell, they were certainly, as judged by their condition, hybernated examples. I have noted them as early as the 10th of June. The life-period of the imago would be probably more correctly expressed as being from August to June, so that I do not think we may regard the seasons as 'curiously out of joint' because of Red Admirals appearing in June. Possibly the long cold spring has had something to do with keeping them longer in their hybernaculum.—ALFRED THORNLEY, South Leverton Vicarage, Notts., 2nd August 1900.

Small Elephant Hawkmoth at Hull.—A disabled specimen of this moth (*Chœrocampa porcellus*), which is, according to Donovan (Plate CCCXIV.) one of the scarcest of the British Sphinges, was found by one of my daughters on the carpet inside the front hall door, which was open, on the afternoon of the 17th July. I fancy it had just escaped from some bird, as one of its wings was injured. I kept the moth a few days, until it died, hoping it might lay some eggs. There is no doubt of its being *Chœrocampa porcellus*, as I showed it to Mr. Boult, the well-known entomologist, of Hull. These hawkmoths fly very fast so it may have been a solitary one from some distance and have flown along the river Hull.—B. B. HAWORTH-BOOTH, Hullbank Hall, Hull, 9th August 1900.

REPORT ON THE BREEDING OF THE LESSER TERNS AT THE SPURN DURING THE SEASON OF 1900.

OXLEY GRABHAM, M.A., M.B.O.U.,

Thornton-le-dale, Pickering; Chairman and Convener of the Y.N.U. Wild Birds Acts Protection Committee.

For the last few years our only remaining Yorkshire colony of these beautiful little birds has suffered shamefully at the hands of egg collectors, who, if they had been permitted, would have soon decimated the remnant that remained. No objection would have been made to an odd clutch being taken for a collection, but when thirty and forty eggs were taken away by a single individual, it was felt that the time had come to step in and interfere, if the birds were not to be entirely driven away from the place. Unfortunately, as at present administered, the Wild Birds Protection Act is nothing less, in many cases, than a dead letter, and were it not that private enterprise frequently steps in, it would be reduced to a mere farce. When the true history of the gradual extermination of many of our rare and interesting birds comes to be written, a very heavy indictment will have to be laid at the door of the egg robber; no doubt the gradual drainage of the bird's favourite haunts, and the increase and spread of an ever-growing population, are very important factors in the case, but the trail of the egg collector is over them all. Birds which are rare in one particular place are generally pretty common in some other locality, and it has always been a mystery to me why such ridiculously high prices should be offered by collectors for certain British-taken eggs when these are common enough on the continent. I am an egg collector in a small way myself, but I can safely say that in my cabinet most of the rarer kinds are represented by continental specimens. Though I have found the nests of nearly all of them in the British Isles, as it gives me far greater pleasure to watch the habits of the birds themselves when incubating their eggs and rearing their young, than it does to take away their nests and eggs. Of course there are egg collectors and egg collectors, but the worst type is he who poses as a naturalist with his right hand, and with his left employs men, honest enough fellows as a rule, but glad in these hard times to earn an additional penny, to collect for him every clutch they can come across of some particular species of bird's eggs. Such a one can only be compared to his ornithological prototype, that arch

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robber the Carrion Crow. I should like to see the law properly enforced. What is the good of it if it is not? An Osprey was shot this year in full breeding plumage, and in open defiance of the law, during the close time, at Scarborough, a most iniquitous and selfish proceeding, for the bird would have given much pleasure by its evolutions on and over the mere to many bird lovers, and yet the offender has never been brought to book. I would have every bird that was not proved to be distinctly injurious to agricultural or horticultural produce, or in other ways mischievous, properly protected by a proper law, properly enforced, and should any bonâ fide collectors desire eggs or specimens of any particular species, they should, on payment of a fixed fee, receive a proper permit to acquire the same.

To return to the Lesser Terns (*Sterna minùta*), a watcher was put on by the East Riding County Council to look after them during the breeding season, and that year they increased and multiplied, but during the ensuing years they were so harried by egg robbers that when I was down there to inquire into the matter last year, the birds were so shy that they left the few eggs that remained to them to the heat of the sun and sand during the daytime, only returning to them at dusk when their enemies had departed. Similarly, when the Ringed Plovers were robbed in like manner some years ago, instead of nesting in their usual places on the sand and shingle they were compelled to take to the cornfields. This year, at the initiative of Mr. W. H. St. Quintin, of Scampston Hall, we collected a small fund to pay the expenses of a watcher, and Mr. Robinson, of Kilnsea, gamekeeper to Colonel White, has most efficiently acted the part of such. I wrote to most of the members of the Yorkshire Wild Birds and Eggs Protection Acts Committee, and to a few others who I knew were interested in preserving from destruction our Yorkshire fauna and flora. From some I received no response, but the following gentlemen most kindly assisted, viz., Messrs. J. Backhouse, T. Bunker, John Gerrard, Oxley Grabham, Claude Leatham, G. T. Porritt, W. H. St. Quintin, who also provided a field-glass, and the Revs. H. H. Slater and W. T. Travis. I feel it is only fair to all those who subscribed that I should give an account of my stewardship. I forwarded the money to Mr. W. H. St. Quintin, and he most kindly disbursed it, and I am very glad to hear that he has a balance in hand, which we trust will be carried forward to assist a similar fund next year, as it has not been required for the costs of any prosecutions which we thought most likely

to occur. I have just received Mr. Robinson's report, and he tells me that, erring on the side of accuracy rather than exaggeration, at least one hundred pairs of the young Terns have been hatched off. They were gathering in one big flock, along with the old birds, ready to take their departure at the end of August. Of course some of the eggs laid have been taken, as, in spite of the assistance of the local policeman, the light-house keepers, and some of the inhabitants, there is a wide stretch to look after, but knowing the conditions and the locality most thoroughly I consider the result eminently satisfactory. Several Arctic Terns (*Sterna macrura*) have been about, but I was not able to satisfy myself that these were breeding in the district. Two pairs of Sheld-Ducks (*Tadorna cornuta*) hatched off their broods in safety, and a goodly number of Ringed Plovers (*Ægialitis hiaticula*), and I am very glad to say that a pair of Oystercatchers (*Hæmatopus ostralegus*), birds which have not nested in the district for some years, did so this season, and laid five eggs, a most unusual number for this bird to lay. I have found many of their nests in various parts of the kingdom, but personally never found more than three eggs in a nest.

NOTE—DIPTERA.

Diptera taken at Ashby, Lincolnshire.—The following species were taken by me during the season of 1899 in the parish of Ashby, Div. 2 of North Lincolnshire, and kindly named by the Rev. Alfred Thornley, M.A. F.L.S.:—

Simulium reptans.
Dilophus febrilis.
Bibio marci.
Scatophaga stercoraria.
Mesembrina meridiana.
Pollenia rudis.
Stomoxys calcitrans.
Calliphora erythrocephala.
Chrysops cæcutiens.
Chrysomyia polita.
Trichocera hiemalis.
Hæmatopota pluvialis.

—R. T. Cassal, Ashby, Doncaster, 3rd September 1900.

NOTES—REPTILES.

Adder in South Durham.—At the monthly meeting of the Darlington and Teesdale Naturalists' Field Club, held on the 21st August 1900, a fine specimen of the Adder (*Vipera berus*), 22 inches in length, was shown by Mr. Thompson, who had obtained this reptile near Egglestone. It was handed to the Curator (Mr. Geldart) to be preserved.—J. W. Fawcett, Satley, Darlington, 3rd September 1900.

Natterjack in Westmorland.—Now and then I see records of the Natterjack toad (*Bufo calamita*) from different districts. May I add that it is much the commoner toad in this district? Many years since—over thirty—I secured several, and, packing them in my vasculum, took them to the carrier to be taken to Kendal next morning for my old friend the late Dr. T. Gough. He wanted them for a friend to put into his greenhouse. The carrier did not know what the contents of the vasculum were, but was somewhat alarmed when, during the night, a loud croaking commenced.—G. Stabler, Levens, Milnthorpe, 2nd August 1900.

NOTES—ORNITHOLOGY.

Goosander in Cleveland, Yorkshire.—A very fine specimen of the male Goosander (*Mergus merganser*) was shot at Yarm on the 20th of February 1900.—J. W. FAWCETT, Satley, Darlington, 21st September 1900.

Little Tern in Northumberland.—An immature specimen of the Little Tern (*Sterna minuta*) was picked up dead near Rothbury, on 23rd August 1900, having been lost in the storm and fogs which prevailed at that date.—J. W. FAWCETT, Satley Grange, Darlington, 21st September 1900.

Gannet at Sleights, near Whitby.—On 22nd August 1900, a male specimen of the Gannet, or Solan Goose (*Sula bassana*), was caught near Sleights Railway Station by a workman on the railway and killed. Its stomach contained nothing but a little decomposed fish.—J. W. FAWCETT, Satley, Darlington, 21st September 1900.

Red-crested Pochard at Redcar.—A fine specimen of the Red-crested Pochard (*Fuligula rufina*) was shot on a marsh near Redcar on 20th January 1900, and is now in my possession. It is, I believe, the first recorded example of this rare duck for Yorkshire.—T. H. NELSON, The Cliffe, Redcar, 4th September 1900.

Red-crested Pochard in Cleveland, Yorkshire.—About the 10th of February of this year (1900) a Red-crested Pochard (*Fuligula rufina* Pall.), a rare bird in the British Isles, was shot at Coatham, near Redcar, the bird afterwards coming into the possession of Mr. A. Johnson, of Middlesbrough. —J. W. FAWCETT, Satley, Darlington, 21st September 1900.

White Bullfinch in Cleveland.—A white Bullfinch (*Pyrrhula pyrrhula*) was obtained at Saltburn on the 26th August 1899. It is a true albino with pink eyes, and the feet even are white. It was preserved by Mr. George Mussell, of Middlesbrough, and is now, I understand, in the possession of its captor at Guisborough.—T. H. NELSON, The Cliffe, Redcar, 4th September 1900.

Black-headed Gull Nesting near Keighley.—Clough Hey reservoir is situated on Keighley Moor, 4½ miles west by south of Keighley. On 27th July last I noticed about a dozen Black-headed Gulls (*Larus ridibundus*) here, and amongst the rushes at the west end of the reservoir I found a young bird unfledged. I do not know of any record of the species breeding in that locality.—H. B. MUFF, Heaton, Bradford, 8th August 1900.

Stone Curlew in Cleveland.—An example of the Stone Curlew, or Norfolk Plover (*Œdicnemus œdicnemus*) was brought to me on 15th December 1899, by a man who had caught it alive, during a snowstorm, on the sandhills east of Redcar. It had, however, been wounded, and died next day. The occurrence of this species in Cleveland is, at any time, unusual, but its presence here in mid-winter is so exceptional as to be worthy of record.—T. H. NELSON, The Cliffe, Redcar, 4th September 1900.

Nightjar on Seamer Moor.—On the 1st of August I was walking to Scarborough in company with a friend. We were crossing Seamer Moor when my little terrier put up a large bird from among the heather. The bird affected lameness and dragged its long wings over the ground in a most ludicrous manner. After only a moment's search my friend found a couple of large eggs lying on the bare ground, with no nest or shelter of any kind. They were the eggs of the Nightjar or Goatsucker (*Caprimulgus europæus*). Considering they lay quite exposed and very near to the road, where numbers of people were passing to and from the large camp on the racecourse, it is extraordinary how they had escaped destruction or detection. The 1st of August seems a very late date for these eggs. Yarrell says the Nightjar lays her eggs about 1st June.—W. C. HEY, West Ayton, Yorkshire, 2nd August 1900.

FISHES OF BOTTESFORD PARISH, NORTH LINCOLNSHIRE.

MAX PEACOCK,
The Manor, Bottesford.

My parochial list of fish for Bottesford (Nat. Hist. Div. 2) is as follows. I have just jotted them down as I have found them in my notes.

Pike. ***Esox lucius*** L. In beck below mill, and some clay ponds, which had no ditch or drain running into or out of them. I believe in the 'pickerel weed,' but not as Walton did. In March or April the pike deposit their spawn amongst aquatic plants. A fragment of weed is carried away by wild fowl with the ova still adhering. If you startle fowl suddenly by coming on them, they often may be noticed carrying away a little weed. The new pickerel weed story is a true romance of science. Heaviest weight, 12 lbs.

Salmon. ***Salmo salar*** L. In the river Trent; but very rarely they run up the large land or warping drains. Once after a heavy flood subsided one was found in a pigsty, untouched by the pig, in the parish of Amcotts (Div. 1). The greatest weight I am sure of is 42 lbs., but my brother Adrian once saw one in Hull with a label on it saying 'A Trent Salmon, 52½ lbs.'

Trout. ***Salmo fario*** L. Rarely found in the beck above the mill dam, having run up from the Trent I suppose. I never saw them below the dam as far as I can remember.

Eel. ***Anguilla vulgaris*** Flem. Very common in all our waters. The broad-nosed females and sharp-nosed males are both plentiful, but not generally at the same time. It is now proved that the difference is one of sex, not specific. Greatest weight, 5 lbs. The eel was never found while we were young in the Knights Templars' Bath in the Home Field (pasture) at Bottesford Manor. About 1872 my brother and I put a number into it. Since then we have both seen and taken eels there, and observed elvers of the smallest size. As the bath is only drained by a sough, they must either travel down it or come over land for fifty yards. It shows there is an instinct for returning to the same spot even in the young, which do not arrive with the older eels.

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Perch. ***Perca fluviatilis*** L. In Bottesford Moors pond, where it was introduced I believe. Often in the outfalls of our drains and claypits. Largest weight, 3 lbs.

Roach. ***Leuciscus rutilus*** L. Rarely found below water mill.

Dace. ***Leuciscus vulgaris*** Flem. Common in the beck and drains.

Bream. ***Abramis brama*** L. Beck and drain outfalls. 5 lbs.

Silver Bream. ***Abramis blicca*** Bloch. The same places as last.

Dab. ***Pleuronectes flesus*** L. In beck below water mill, and river Trent drains.

Minnow. ***Leuciscus phoxinus*** L. Beck outfall.

Three-spined Stickleback. ***Gastrosteus aculeatus*** L. In our fresh and brackish waters.

Ten-spined Stickleback. ***Gastrosteus pungitius*** L. In the drains with the last.

Gudgeon. ***Gobio fluviatilis*** Flem. In the beck above and below mill.

Carp. ***Cyprinus carpio*** L. Introduced into Bottesford Moors fishpond.

Tench. ***Tinca vulgaris*** Cuv. In beck outfall and drains, and Moors fishpond.

Loach. ***Nemachilus barbatulus*** L. In beck and drain outfalls at times.

Sturgeon. ***Acipenser sturio*** L. Sometimes gets out of the Trent into drain outfalls.

Bullhead. ***Cottus gobio*** L. The same.

Sea-trout. ***Salmo trutta*** Flem. The same.

Smelt. ***Osmerus eperlanus*** L. The same.

Conger. ***Conger vulgaris*** Cuv. The same.

Lampern. ***Petromyzon fluviatilis*** L. The same.

This is only a list of the fish I have observed in Bottesford Parish at various times during the last twenty-five years. I cannot speak of the Trent fishes, a full list still wants writing. The fish of Bottesford Beck are now destroyed chiefly by sewage from Scunthorpe, Frodingham, Crosby, and Ashby, but also by the gas water from the ironworks. This list would have been true from 1870-1880, hardly later in every particular.

ON THE SLIME-THREADS OF PLANARIAN-WORMS.

H. WALLIS KEW, F.Z.S.,
London; formerly of Louth, Lincolnshire.

CERTAIN Mollusca-Gastropoda are well known to make slime-threads by which they descend through the air or water.

The thread—in land-slugs, air-breathing water-snails, and sea-slugs—is not the product of a special spinning-organ, but consists of ordinary locomotory mucus, and is, in fact, a continuation of the slime trail which the creature always leaves in its path.

The animals with which we are at present concerned, the Planarians or Flat-Worms of the order Turbellaria, though far removed from the Mollusca and immeasurably lower in the scale, are found, somewhat oddly, to make a surprisingly similar use of slime-threads—the comparison being with the naked Mollusca-Gastropoda rather than with those bearing shells.

The land-planarians (terrestrial Turbellaria-Tricladida), requiring much shade and moisture, move from their retreats chiefly at night, creeping like slugs on a flattened ventral surface. Progression is effected by the action of cilia, aided by muscular undulations which proceed from the anterior extremity backwards, not from behind forwards like the locomotory wave-like appearances of Mollusca-Gastropoda; and thus the land-planarian's locomotion, though superficially like that of a slug, is really of different nature, being truly vermicular and having nothing to do with the highly characteristic Gastropodan mode of progression. In both cases, however, the creature emits a continuous film of locomotory mucus, the land-planarian, like the slug, leaving a slime-trail wherever it goes; and this trail, in the planarian as well as in the mollusc, may be continued as a thread, capable, for a time, of suspending the animal as it descends from its support.* The land-planarian, however, crawling from an object and not finding a new resting place, soon falls—the thread, less reliable even than that of the mollusc, quickly giving way, and never, as far as is known, serving for long descents like those occasionally accomplished by slugs.

* It is the same, probably, in the case of other trail-leaving creatures, e.g., Nemertines: see McIntosh, Monograph of British Annelids: Nemerteans, 1873-4, pp. 6, 177.

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Our notes on land-planarians relate to three small species: *Rhynchodemus terrestris, R. sylvaticus,* and *Geodesmus bilineatus*; and to four species of *Bipalium*: animals of considerable length, possessing a peculiar anterior extremity, which takes, at full extension, the shape of a grocer's cheese-cutter.

The first observations known to the writer are those of Sir W. Elliot on *Bipalium lunatum.** The animal (about five inches long) occurs in gardens around Madras, where it crawls among decaying vegetation, often raising the anterior extremity and using it as a feeler. When it arrives at the end of a leaf or twig, the observer says, it reaches out in search of a new resting place, trying in all directions with the anterior extremity; and if nothing offers, 'it stretches forward until nearly the whole body is disengaged, and it is left at length hanging from the posterior extremity, by means of the viscid secretion, which, on other occasions, marks its track, till it has descended to twice or thrice its own length, when the thread attenuates and breaks, and the animal falls to the ground.'† (Fig. 1).

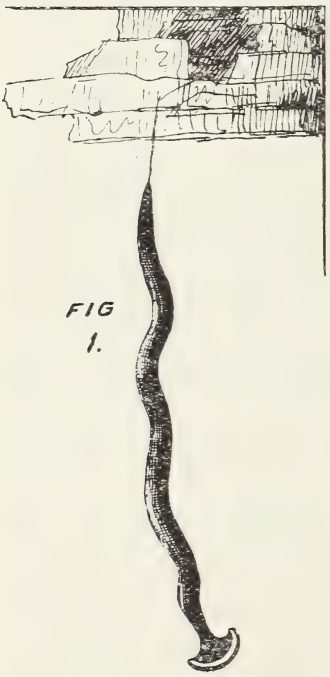

FIG 1.

Bipalium lunatum forming a slime-thread. After Elliot, Madras Journal of Literature and Science, XV. (1848), Pl. I., Fig. 4.

Prof. Moseley, unacquainted with Sir W. Elliot's paper, has remarked that the slime of certain land-planarians observed by him in Ceylon is so tough that the animal can suspend itself by a thread formed of it; the planarians referred to, *Bipalium diana* and *B. proserpina*, had several times lowered themselves thus from the observer's hand to a table by making a thread 6-7 inches long.‡

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* *Planaria lunata.*

† Elliot, Madras Journal of Literature and Science, XV. (1848), pp. 162-7.

‡ Moseley, Nature, VI. (1872), pp. 64-5. Moseley recurs to this subject in his celebrated memoir on the 'Land-planarians of Ceylon' (1), where it is

Other notes relate to *Bipalium kewense*: a species of unknown habitat which has made its appearance in hothouses and elsewhere in gardens, etc., in various parts of the world. It is a large species, ordinarily about 9 inches long; and Dr. Richters, who writes of a specimen from the Frankfurt Palm-garden, doubts whether it can suspend itself, because of its weight;* Mr. Trimen, who observed specimens at the Cape, has expressed himself doubtful on the same point;† and the present writer, who, through the kindness of Mr. Gude, received two specimens (one of full size, and one small) from a nursery at Upper Holloway, has attempted to induce the animals to spin, with but moderate results. When placed on small objects and exposed to the light, the creatures readily crept off after the fashion of slugs, but their suspension was of very short duration, the slime-thread failing when ½-2½ inches in length (Fig. 2); the full-grown specimen, while thus dropping, became

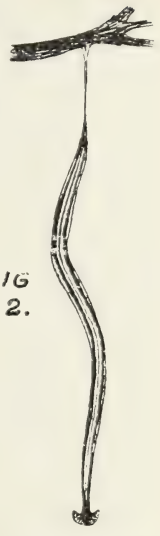

FIG 2.

Bipalium kewense (young) descending from a twig; drawn from life by the writer.

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stated that *Bipalium* uses a thread of its tough investing slime for suspension in air, the author having frequently seen it let itself down in this manner from a twig held at a short distance from the ground. Statements by Shipley (2) that the mucus of some tropical species 'hardens into threads by means of which the animals suspend themselves' and that the creatures 'are occasionally blown, hanging at the end of their threads, from one stem or branch to another, like the young of many species of spiders' appear to have grown out of the above noted observations of Moseley. Mr. Shipley has obligingly given to me, as his authority, the following passage from Loman's memoir on *Bipalium* (3): 'Wie die Schnecken lassen sie eine schleimige Spur hinter sich, die, wie uns *Humbert* mitgeteilt hat, zu einem harten Faden erstarrt, der das Gewicht des Körpers trägt und an dem sie sich von einem Zweige zum anderen herablassen können.' Humbert, however, (4) does not mention threads; and Dr. Loman, who tells me that he did not make observations of his own on this point, has now no doubt that he wrote 'Humbert' in mistake for 'Moseley.' (1) Moseley, Philosophical Transactions of the Royal Society, CLXIV. (1874), pp. 112, 146; (2) Shipley, Proceedings of the Cambridge Philosophical Society, VII. (1891), pp. 142-7; (3) Loman, Bijdragen tot de Dierkunde, uitgegeven door het Genootschap Natura Artis Magistra, Amsterdam, XIV. (1887), p. 66; (4) Humbert, Mémoires de la Société de Physique et d'Histoire naturelle de Genève, XVI. (1862), pp. 293-311.

* Richters, Der Zoologische Garten, XXVIII. (1887), pp. 231-4.

† Trimen, Proceedings of the Zoological Society of London, 1887, pp. 548-50.

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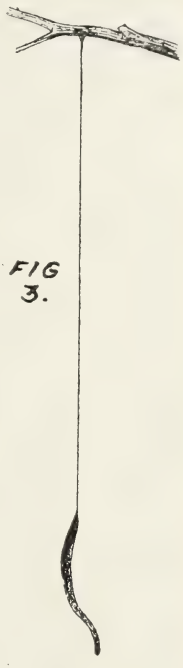
much attenuated, its body attaining the extraordinary length of 14 inches. Dr. Scharff, more fortunate, observed a specimen from a greenhouse at Straffan, Co. Kildare, descend by a thread which did not break until it was 8 inches in length;* and Mr. Lehnert, who had 12 specimens of this planarian from Leipzig, Berlin, Kew, etc., saw the creatures hang by threads of equal or greater length. The last-named naturalist, who made numerous observations, recognises that the thread is identical with the slime-trail of ordinary progression, and that, though it appears to be drawn from the posterior extremity of the animal, this is not really the case, for the creature when in the air is creeping by means of its cilia upon the locomotory mucus which it emits from the creeping-sole, and this mucus, when left by the posterior extremity of the animal, forms the thread. The animal, Lehnert says, gradually crawls from its support, the free anterior portion, in the meantime, executing various movements; finally, the posterior extremity passes from the support, and the animal hangs in the air by a thread continued from the slime-film left upon the support. The suspended animal, sometimes holding its body exactly as though it were crawling upon a solid surface, sometimes swings and turns, and curves its anterior part in various directions. The thread, the slime for which the sole continues to secrete, is gradually lengthened, and it may sustain the descending, free-hanging animal till the length of the thread about equals the length of the animal's body. If the creature has not by this time encountered a new support, the thread usually gives way, and the animal drops. If, on the other hand, a new support has been found, the thread persists, and the animal, still sustained by it posteriorly, crawls with its anterior part upon the new support, and the rest of the body follows gradually, the hinder portion descending vertically along the thread-forming mucus until the whole of the animal has occupied the new support. The thread, the stress upon which is gradually relieved as the new support is occupied, may thus attain a length about twice that of the animal's body—the creature being capable, it will have been gathered, of descending in safety from one object to another two lengths distant. Usually, though not always, the thread breaks off when the posterior extremity reaches the support; and, thus liberated, it contracts irregularly. During the descent the animal sometimes becomes more or less twisted; and in this case, as it crawls

* Scharff, Irish Naturalist, III. (1894), p. 242.

forwards on the new support, the twists move gradually backwards over the body and are finally transmitted to the thread. Only a limited number of safe descents, Lehnert further notes, can be made in succession; after four trials, the creature, supported only by a very short attachment, drew itself together and fell to the ground.* Dr. Bergendal has written on the same subject, stating that *Bipalium kewense* has been seen to descend by threads in the Botanic Garden in Berlin, and that, while keeping specimens in captivity, he had frequently seen the same phenomenon; he had nothing to add, however, to Lehnert's observations.†



Rhynchodemus terrestris descending from a twig; drawn from life by the writer. Slightly enlarged.

As regards the smaller land-planarians, Dr. Leidy has a remark for *Rhynchodemus sylvaticus*‡ (North America) that the creature secretes a delicate mucous thread;§ and a few observations have been made by the present writer on *Rhynchodemus terrestris,* collected under fallen logs in woods in Lincolnshire. My specimens were ½-¾ inch long; and when placed on small objects they crawled off like little slugs; some fell without any retaining thread; but in one case, the thread, which was very delicate, did not fail till it had attained a length exceeding 2½ inches—more than three times the length of the animal's body. (Fig. 3.) *Geodesmus bilineatus,* another small species—found in greenhouses in various places in Europe—has been observed by Lehnert; the suspensory thread, however, never exceeded the length of the creature's body.‖

In addition to threads used for descent, Lehnert refers to 'bridge-threads,' formed, as he observed in *Bipalium kewense* and *Geodesmus bilineatus,* when the animal passes from one object to another, the distance between which does not exceed

* Lehnert, Archiv für Naturgeschichte, LVII. (1891), pp. 306-50.

† Bergendal, Studien über Turbellarien, 1892, pp. 1-42 (Kongliga Svenska Vetenskaps-Akademiens Handlingar, XXV.).

‡ *Planaria sylvatica.*

§ Leidy, Proceedings of the Academy of Natural Sciences of Philadelphia, V. (1850-1), pp. 141-2.

‖ Lehnert, l.c.

the length of the fully extended animal. Writing of the *Bipalium,* the observer points out that an interruption in the continuity of the support on which the animal is crawling, if of less distance than the length of the animal, offers no barrier to its progress; where the support ends the anterior part of the body is extended into the air in search of a new support, and when such is found, the anterior extremity comes into contact with and proceeds to occupy it, the remainder of the body following in a straight line. When the posterior extremity leaves the old support it is sustained by the locomotory mucus, and is thus drawn through the air exactly in the same line as the foregoing part. The mucus, left behind in the form of a thread, stretches from point to point, and bridges the interruption. As in the case of descent, this thread has the appearance of being produced by the posterior extremity; but, in reality, as Lehnert says, it is commenced, as the uninterrupted slime-layer of the sole, the moment the anterior extremity touches the new support. The thread, which soon dries, frequently remains in position for days; but the animal has not been seen to use it again as a permanent bridge.* Similar threads, as appears probable from an observation by Sir W. Elliot, are available for progression across the surface of narrow channels of water. When a bottle in which some *Bipalium lunatum* were kept was placed in the middle of a basin of water, the creatures 'crawled out till they encountered the surface of the fluid, which at first they seemed unwilling to face; but, at length, after many attempts, and much apparent repugnance, some of the larger ones pushed forward their heads, retaining their hold upon the cork by the tail alone, till they touched the edge of the basin on which the disc-like head was firmly fixed, and the body was drawn after it.'† Some of the creatures, in this manner, escaped, presumably without dipping into the water, the body doubtless passing over a floating bridge-thread—a continuation of the ordinary slime-trail. It thus appears that with this *Bipalium* a channel of water less in width than the animal's length need not prohibit the creature's onward motion; the same is the case, no doubt, with many planarians; and it is interesting to note that *Geodesmus bilineatus* was found by Lehnert to be able, by means of its locomotory mucus, to extend its body upon water. If no new support was within reach, the *Geodesmus*

* Lehnert, l.c.

† Elliot, l.c.

withdrew; or, as sometimes happened, it broke through the surface-film and fell into the water.*

Turning now to the water-planarians, we find that some, like the land-kinds, are known to draw out threads.

The freshwater Tricladida, the common planarians of the ponds and streams, are somewhat flatter and less slender than land-planarians, and are of but moderate size, hardly ever exceeding an inch in length, and usually much smaller; they progress with an even, gliding motion, and, like land-planarians, etc., they leave a slime-trail in their path; † like molluscs, they creep, not only on solid surfaces, but also on the under-surface of the water; and this they do, as shown by Willem ‡ and by Lehnert, by means of the floating slime-trail which the animal deposits as it proceeds.

Of these planarians we have notes for two genera: *Planaria* and *Polycelis*; and we find that the thread, which they make during descent through the water, may start, either from a slime-trail on a solid body, or from a floating trail at the water's surface.

The thread was first noticed, in 1814, by Sir J. G. Dalyell, who kept hundreds of individuals of planarians of this kind in captivity in glass vessels. This naturalist writes of *Polycelis cornuta* § that when dropping from the surface of the water to the bottom of the vessel (a habit common to other species) 'it seems to exercise a faculty belonging to the caterpillar, of spinning a silken thread, visible only when so much aggregated as to interrupt the rays of light.' The purpose of the thread, the author supposes, is to check the rapidity of the descent; and a complete view of its effect may be obtained, he adds, by including a plant of Veronica, crowded with planarians, within a tall glass jar. The numerous descents from the upper leaves, in this case, 'quickly form a perceptible column, owing to the infinity of glutinous or silken lines.' ‖ In a later work, under '*Planaria arethusa*,' the author writes:—

> This animal, in common with its kind, is protected from abrasion by a superficial glutinous secretion investing the body, whereby it may,

* Lehnert, l.c.

† J. R. Johnson, Philosophical Transactions of the Royal Society, 1822, p. 439; Lehnert, l.c.

‡ Willem, Bulletins de l'Académie Royale des Sciences, des Lettres et des Beaux-Arts de Belgique (3), XV. (1888), p. 429.

§ *Planaria felina*.

‖ Dalyell, Observations on Planariæ, 1814, pp. 46-7.

perhaps, find the means of its suspension in the water, as if by a thread, which is frequently practised. If truly so, we need not seek for any secretory organ near the posterior extremity, as appearances might lead the observer to conjecture. Many having congregated on a plant hung in the vessel containing them, some detached themselves successively in order to descend, but several individuals, at once, taking advantage of a thread belonging to their neighbours, which was discernible by a magnifier, broke it from their accumulating numbers, and the load precipitated amidst the fluid, dispersed below. The glutinous matter may be drawn off the body of the animal on quitting its hold or adhesion to any surfaces.*

Further observations have been made by Lehnert, who refers in this connection to *Planaria lactea*† and *Pl. polychroa*, but principally to the *Polycelis tenuis* Iijima: an animal, about ½ in. long, apparently allied to our common *Polycelis nigra*. The character of the spinning, it is said, is the same as that of land-planarians; but, owing to the water-planarian's smaller specific gravity, the thread can be continued to a greater length —many times the length of the animal. The *Polycelis*, moreover, Lehnert says, can climb up its suspensory thread‡: an observation which appears to be unique as far as the planarians are concerned.

For Polycladida we have no observations, and may thus pass to the remaining tribe—Rhabdocœlida—small, often minute creatures, progressing by creeping both on solid bodies and at the water-surface; and capable also of swimming.

Our notes, for Rhabdocœlida, relate to two very dissimilar genera, *Monotus* and *Mesostoma*.

Dalyell remarks of the minute littoral *Monotus lineatus*§ that it is 'apparently sustained by an invisible thread when falling through the water'‖; and Jensen and von Graff have referred to the thread of the allied *Monotus fuscus*.** The latter animal, it is said, congregates in swarms, in captivity, at the surface of the water, and when the vessel is shaken the creatures

*Dalyell, The Powers of the Creator displayed in the Creation, II. (1853), p. 113. '*Planaria arethusa*,' as Mr. F. W. Gamble obligingly informs the writer, is probably the form now known as *Planaria alpina*. Dalyell further notes (tom. cit., p. 116) that his marine '*Planaria variegata*,' when dropping through the water, seems to be retarded by an invisible thread; but this animal, as suggested by Johnston (Catalogue of Non-parasitical Worms in the British Museum, 1865, p. 12), is probably a mollusc.

†*Dendrocœlum lacteum*.

‡Lehnert, l.c.

§ *Planaria flustræ*.

‖ Dalyell, 1853, tom. cit., p. 118.

** *Monocelis assimilis* (in Jensen).

fall or let themselves down by their threads to the bottom.* Of the little freshwater *Mesostoma rostratum,*† Dalyell notes that its adhesive faculty is so slight that the containing vessel can scarce be touched without the consequent cessation of the animal's hold; the same, he adds, is a leading characteristic of other planarians, though in an inferior degree; 'they suddenly abandon the plane of position, and drop through the water, with contortions of the body, as if to break their fall, while they are evidently aided by a filament invisible to the naked eye.'‡ For larger species of this genus, *M. ehrenbergii* and *M. tetragonum* (the former ½ inch or more long), we have observations by Professor Schneider, who states that the creatures attach a slime-thread to floating Duckweed (*Lemna*), and suspend themselves from it head downwards; and it sometimes happens that whole companies of them are seen in this position.§ Dalyell says that *M. rostratum,* possessed of extraordinary activity, swiftly traverses the substances surrounding it, with its snout-like anterior extremity incessantly in motion as if in search of prey‖; and in some of the books we find, for *M. ehrenbergii,* etc., the surprising statement that the creatures 'ensnare their prey by means of slimy threads.'** The statement arises, no doubt, from observations by Schneider, who remarks of the two species referred to by him that they use their slime in a murderous manner for the capture of prey—small worms, Entomostraca, mites, larvæ of Notonecta, etc. The Entomostraca are preferred to anything else, and when one of them approaches, the *Mesostoma* gives it a slight blow with the anterior extremity, whereupon the victim becomes covered with slime and is unable to get away; large numbers of these little creatures, moreover, become entangled in the slime which the *Mesostomas* leave about the vessels in which they are kept. The capture of comparatively large prey, such as larvæ of *Notonecta,* is a less easy task; and Schneider affirms that the *Mesostomas* catch these creatures in nets which they spin at the surface and through the water; if there are no larvæ in

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* Jensen, Turbellarier ved Norges Vestkyst, 1878, p. 68; L. v. Graff, Monographie der Turbellarien: I. Rhabdocœlida, 1882, p. 424.

† *Planaria velox.*

‡ Dalyell, 1814, op. cit., p. 131.

§ Schneider, Untersuchungen über Plathelminthen, 1873, pp. 23-5.

‖ Dalyell, 1814, op. cit., pp. 130-1.

** Royal Natural History, VI. (1896), p. 469.

the vessel, he adds, no nets are spun.* In most planarians, the slime — often charged with minute offensive rods — plays an important part in the overpowering of prey; but it is improbable, as it seems to the writer, that nets of slime are ever specially spread for this purpose; the nets in which the larvæ of *Notonecta* were caught, one can well imagine, may have consisted merely of threads or trails of mucus deposited by the *Mesostomas* during their wanderings through the water and along its surface. As regards the source of the slime, Schneider describes in detail certain glands (Spinndrüsen), distributed over the ventral surface, chiefly in the median line.

In reviewing the facts now detailed, the chief point which presses itself upon our attention is that mentioned at the outset—the similarity of the observations with those recorded for the very different animals, Mollusca-Gastropoda. The behaviour of land-planarians as above noted, down to some of the small details, is surprisingly similar to that of land-slugs; and the conclusions of Lehnert on the production and use of the thread of *Bipalium* and *Geodesmus* are almost identical with those at which the writer has arrived with regard to the thread of *Limax* and *Arion*. It is in the length to which the thread may extend that the chief difference occurs, for while the longest thread recorded for a land-planarian was little more than three times the length of the animal, a land-slug (which, however, is a less slender creature) has been observed by the writer to make a thread more than 70 times its own length, and still longer threads have been recorded by authors; further, no land-planarian appears to have been seen to ascend the suspensory thread, a thing which slugs do with some facility. This latter break in the analogy, however, is filled by the water-planarian, *Polycelis,* which, like a water-snail, can ascend its somewhat lengthy thread. In other respects, moreover, the water-planarian's use of a thread is very similar to that of some aquatic molluscs; both kinds of animals, it may be noted, descend, not only from aquatic plants, but also from the surface of the water. The bridge-threads referred to by Lehnert are of the nature of similar threads made by slugs and other molluscs.

The planarian's thread used for descent is probably formed chiefly when the animal has to escape from dangerous surroundings; and this is true, presumably, both for water and land kinds. With regard to land-slugs, the writer has concluded

* Schneider, l.c.

that it is chiefly when they have to escape from harmful exposure that they descend; and the same is the case, doubtless, with land-planarians, for the latter animals, even more distinctly than slugs, are moisture- and shade-loving creatures, living much under cover, and soon succumbing to unavoidable exposure. At certain times, however, chiefly at night, many land-planarians creep to moderate heights on herbage, tree trunks, fences, etc., in which positions they must occasionally be surprised by the appearance of day-light or sunshine, or by the disappearance of moisture from the atmosphere, and it is then, doubtless, that they usually crawl from their supports. The slime-thread which may now be formed may serve a useful purpose in breaking the animal's fall, or in enabling it, if cover be near at hand, to escape in safety without falling. One may doubt, however, whether the advantage thus gained is of much importance; and the writer is inclined to regard the so-called spinning faculty of planarians (and of slugs) as little more than an accidental circumstance, arising out of the possession, for ordinary locomotion, of a continuous supply of tenacious mucus.

NOTE—ORNITHOLOGY.

Co-operation of Birds in Nesting.—In the season of 1893, as soon as the old pair of Rooks (*Corvus frugilegus*) that had built their nest in a pear tree down at the Warp Farm, Bottesford Moors (Div. 2), had reared their brood and taken them a-field, a Wild Duck (*Anas boschas*) took possession of the deserted nest. She laid nine eggs, but these were taken and sent to the South of England to be incubated under a tame duck. Since then a clutch of young Starlings (*Sturnus vulgaris*) have been reared from a nest situated in the lower part of the bundle of sticks that formed the foundation of the nest. Two lots of Sparrows (*Passer domesticus*) have been reared within the bounds of the original framework. But (19th July) this is not all, for now a pair of Kestrels (*Tinnunculus tinnunculus*) have taken a lease of the house for a time, and are busy rearing a clutch of four young ones. Some more sparrows may take to it later, if Mr. and Mrs. K. leave the place when their fledglings can fly. Co-operation amongst game birds and domestic poultry is no uncommon thing. I have often known Hens and Pheasant, Guinea-fowl and Pheasant, Red-legged Partridge and Pheasant, Common and Red-legged Partridge, Red-legged Partridge and Guinea-fowl, Common Partridge and Guinea-fowl nest together; sometimes one hen bird, sometimes the other would do the incubating, but seldom both. On one occasion I found a nest (we were mowing a meadow) that contained in all 34 eggs—Pheasant, 7; Guinea-fowl, 19; Red-legged Partridge, 8. The Partridge was sitting on some of these eggs, but, needless to state, she could not cover one half the quantity that were left to her care. In 1894 one of my Guinea-fowls and a French Partridge nested in conjunction; both birds sat and hatched out the eggs. Some of the Guinea-fowl were taken along with the Partridge and some of the Partridge followed the Guinea-fowl; all the youngsters got to fly. The Guinea-fowl were shot the following March; they were quite wild and roosted in the trees along with Pheasants.—MAX PEACOCK, Bottesford, Lincolnshire, 10th July 1900.

NOTE—FUNGI.

Giant Puffball near Lincoln.—A small specimen of the edible Giant Puffball (*Bovista gigantea*) has just been brought me by Mr. T. Rippon, an entomologist, gathered by him near Lincoln to-day.—J. Eardley Mason, Lincoln, 4th September 1900.

NOTE—ENTOMOLOGY.

Insects taken at Cadney, near Brigg.—The following gathering of Cadney insects was made on the 19th of August, and named by the Rev. A. Thornley, of South Leverton, Notts., to whom Lincolnshire naturalists owe a debt of gratitude for his kind and continual help:—

Odonata (Dragon Flies).

Æschna grandis. One ♂.
Æschna cyanea. Two ♂s.
Sympetrum scoticum. Six ♂s and two ♀s (the ♂s are nearly black, ♀s yellowish).
Sympetrum striolatum. One ♂.
Lestes sponsa. One ♀.
Ischnura elegans. ♂ and ♀.

Hymenoptera.

Bombus hortorum. Two workers.
Halictus cylindricus. ♂s.
Odynerus parietum. ♂.
Ophion luteus (Ichneumon Fly).
Pimpla instigator (Ichneumon Fly).

Diptera.

Syrphus balteatus.
Stomoxys calcitrans.
Eristalis arbustorum. ♂.

Hemiptera.

Calocoris bipunctatus.
Philænus spumarius (Cuckoo-spit Insect).

Orthoptera (Grasshoppers, etc.).

Stenobothrus bicolor.

Coleoptera.

Lagria hirta.
Aphodius merdarius.
Phœdon tumidulum.
Sitones hispidulus.

—Max Peacock, Cadney, Brigg, 11th September 1900.

NOTES—COLEOPTERA.

New Habitat for *Hydroporus septentrionalis*.—A few days ago, on getting out of my morning tub, I observed a small insect swimming in the water. On capturing it, I saw at once it was the scarce *Hydroporus septentrionalis*. I have often made an eight miles' journey to a little Alpine rill to secure a few examples of this insect, but truly 'everything comes to him who waits.'—W. C. Hey, West Ayton, York, 2nd August 1900.

Beetles taken at Ashby, Lincolnshire.—The following species were taken by me during the season of 1899 in the parish of Ashby, Div. 2 of North Lincolnshire, and kindly named by the Rev. Alfred Thornley, M.A., F.L.S.:—

Pterostichus nigrita.
Pterostichus vulgaris.
Otiorrhynchus picipes.
Otiorrhynchus tenebricosus.
Rhinosimus ruficollis.
Aphodius inquinatus.
Aphodius fimetarius.
Aphodius contaminatus.
Dromius nigriventris.
Dromius quadrimaculatus.
Hydrobius fuscipes.
Apion humile.
Erirrhinus vorax.
Bembidium littorale.
Harpalus æneus.
Adalia bipunctata (black var.).
Halyzia 14-guttata.
Anaitis ocellata.
Mecinus pyraster.
Phyllobius pyri.
Phyllobius argentatus.
Quedius mesomelinus.
Tachyporus obtusus.
Calathus melanocephalus.
Dromius meridionalis.
Chrysomela polita.
Sphæridium 4-maculatum.
Attagenus pellio.
Strangalia armata.
Pogonochærus bidentatus.

—R. T. Cassal, Ashby, Doncaster, 3rd September 1900.

OCCURRENCE OF THE NUTCRACKER IN LINCOLNSHIRE.

F. M. BURTON, F.L.S., F.G.S.,
Highfield, Gainsborough, Lincolnshire.

On the 14th of August last I had the good fortune to come across the Nutcracker (*Nucifraga caryocatactes*) in a wood, principally of pine, on the south-west side of Scotton Common.

I was first attracted by its very loud and raucous notes, totally unfamiliar to me, resembling more the noise one hears in the parrot-house at the 'Zoo.' than any English bird. Seebohm describes these notes as of two distinct kinds, 'one probably the call note, a sort of *Kray, Kray,* the other louder and more energetic, the alarm note, a *Kr, Kr, Kr,* almost as grating to the ear as the note of a Corncrake.' This to my mind conveys but a feeble description of the sound; for though, in this case, the cry may have been intensified by the hollow silence of the pine wood, the notes of the noisiest English bird—Corncrake or Jay—are 'mellow music matched' with the sounds I heard.

Butler, in Vol. 2 of 'British Birds,' gives a more correct account of the cry, for, in quoting Mr. John Hancock, he says: 'Its voice was very peculiar. It had an extremely harsh, loud cry resembling the noise produced by a ripping saw while in full action. This cry was so loud that it could be heard all over the house.'

'At the nesting-time,' Seebohm says, 'the bird is silent'; and it is worth noting that on the 6th of June last, in the same wood, a bird larger than a Jay, which I could not identify, flew from the top of a pine over my head into an adjoining tree, without uttering a sound. All I could make out while it was in sight, was that its colour appeared light brown, and its flight was an undulating curve, and this accords with the accounts given of the Nutcracker's flight; for Seebohm describes it as 'peculiar, slow, undulating, and jay-like'; and Morris gives it as 'wavering and unsteady, avoiding crossing any open space,' etc.

One corner of the wood at Scotton Common consists of a thick plantation of young larch trees from which the sounds came, and, on my going cautiously up to it, three birds, about the size of doves, flew out without uttering a sound; but, immediately, close to me, the cries I had heard before broke from apparently more than one quarter.

1900 October 1.

Three others who were of my party heard the cries, independently one of another, and two of them saw the bird; while each corroborated the account I give, describing the flight as undulating like that of a Woodpecker, and the notes as being exceedingly harsh and loud.

So far as I can ascertain the nest of this bird has not hitherto been found in England, though it occurs in various parts of Europe. Possibly it may have been overlooked, but, if not, there is no reason why it should not be met with in this country. Whether, however, the bird I saw in June was a Nutcracker, and whether the three birds I saw fly out from the larch trees were the young of that species with their parents—and Nutcrackers are in the habit of going in small flocks, parents and young—of one thing there is no doubt, that the bird I met with last August was '*Nucifraga caryocatactes.*'

There is one, and only one, previous record of it in Lincolnshire, and that occurred near Sleaford, where it was shot in March 1833, and, through the liberality of Colonel Mason, is now in the Lincoln Museum.

20th September 1900.

NOTE—FISHES.

Sturgeon off the Durham Coast.—On Tuesday, the 17th July 1900, a fine Sturgeon (*Acipenser sturio*), weighing 98 lbs., was landed at Hartlepool, and was sold for the sum of £2 5s.—J. W. Fawcett, Satley, Darlington, 19th September 1900.

NOTES—MAMMALIA.

Pine Marten in Cleveland.—In January of this year (1900) a fine specimen of the Pine Marten (*Martes martes*) was trapped at Swainby in Cleveland, Yorkshire.—J. W. Fawcett, Satley, Darlington, 21st Sept. 1900.

Peggy-hotchen versus Wasp.—The other evening I saw a Hedgehog (*Erinaceus europæus*) not far from the mouth of a disused rabbit-burrow; he was apparently eating the young Wasps from a piece of wasp-comb. About fifty of these insects were flying around him, sometimes settling on him, but in no way inconveniencing Peggy. This is the first time I have seen the like. Does the Hedgehog make a practice of scratching out wasp-nests and eating the grubs?—Max Peacock, Bottesford (Div. 2), Lincolnshire, 31st July 1900.

Deceived Bats.—I have a hammock in my orchard suspended between two apple trees. One moist day, early in June, a shower damped it, and I hung it up in a position to open the meshes as widely as possible to hasten the drying process. The bloom from the trees was falling and many petals became entangled in the net. As the twilight deepened the net became invisible, and the white petals only could be seen, suspended as it were in mid-air. We were much amused at seeing some Bats—species undetermined—make repeated dashes at these petals, evidently mistaking them for the white moths which frequent this orchard in numbers.—W. C. Hey, West Ayton, Yorkshire, 2nd August 1900.

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Mammals of Bottesford Parish.—Max Peacock.

Appendix to Miss Stow's Florula of Woodhall Spa.—J. Cosmo Melvill, M.A., F.L.S.

Lincolnshire Naturalists at Horncastle.—Rev. E. A. W. Peacock, L.Th., F.L.S., F.G.S.

Constituents of North Lancashire Flora, No. 19.—S. Lister Petty.

Yorkshire Boulder Committee: Report for 1899.—J. H. Howarth, F.G.S.

Florula of Worksop District, Notts.—Rev. Hilderic Friend.

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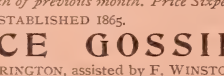

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American Monthly Micro. Journ., Nos. 229-233, Jan.-May, 1899. [C. W. Smiley, Publ.
Birmingham N.H. and Phil. Soc.—Proc., Vol. 10, Part 2, Section 1, N.D. [Society.
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Journal of Malacology, Vol. 7, No. 7, 29th Sept. 1900. [W. E. Collinge, Editor.
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Entomologists' Record, Vol. 12, No. 10, 15th October 1900. [J. W. Tutt, Editor
The Irish Naturalist, Vol. 9, No. 10, for October 1900. [The Editors, Dublin
The Zoologist, 4th Series, Vol. 4, No. 712, 15th Oct. 1900. [West, Newman & Co., Pub
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Martinus Nijhoff.—Livres Anciens et Modernes, Sciences Naturelles, 1ère partie Oct. 1900. [Publisher
Institution of Mining Engineers.—Circular re Conference of Delegates. [Institute

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PROTECTION OF THE LESSER TERN AT THE SPURN.

T. PETCH, B.Sc., B.A.,
Hedon.

THE report of the Yorkshire Wild Birds Protection Committee in the October 'Naturalist' will be welcomed by all true ornithologists for the promise of better things which this year's work seems to convey. We have at last mastered the proposition—an axiom to other counties—that all real bird preservation must depend on private enterprise, and that no county council will expend its funds, nor a rural policeman his energy, on what appears to them merely a question of sentiment. It seems ungracious to criticise, but I must suggest that the watcher be employed solely for that purpose. Spurn presents more difficulties than any other protected area I know of. The length of the colony, the children living on the spot, the Grimsby trippers, and the gravel diggers who walk from Kilnsea to Spurn daily—all these make the watcher's task by no means an easy one. In addition, we have to contend with a population which has learnt thoroughly the lesson taught by unthinking 'naturalists,' that every natural object has its price. Entomology, as well as ornithology, has its resident collectors, though they are not as numerous. It would be interesting to ascertain the number of gun licences taken out in the district.

The history of the protectorate during the last four years furnishes examples of all the dangers to which the Tern are exposed. In 1897 a watcher was appointed by the County Council, but, unfortunately, he had very little to watch. The spring-tides of June, known in Norfolk as the bird-tides, do not attain the usual spring-tide level, and therefore do not cover the Terns' nesting-ground; but on this occasion they rose considerably above their normal height, and the eggs and nestlings of Tern, Ring Plover, and Lapwing were destroyed all along the east coast. I happened to visit a Norfolk breeding station at the time of high water on 15th June 1897, and, having 'marked' a bird, walked up to the spot expecting to find the nest. It was only after three or four unsuccessful attempts that we discovered that the bird was descending to the broken eggs in the water. The Spurn colony of *Sterna minuta* is particularly liable to be destroyed in this way, as the birds frequently lay their eggs on ridges parallel to the Point. In 1899 the majority of the nests were on the top and western slope of such a bank,

and a further rise of six inches would have swept them away. After this catastrophe the need of a watcher was surely more urgent than ever, but we had no one in 1898 or 1899. In these years systematic collection proceeded unchecked. I made several visits in 1899, and on each occasion put to flight parties of Spurn children engaged in egg-collecting. One Grimsby tripper alone took thirty-four eggs. As Mr. Grabham relates, a watcher was employed this year (1900). I am afraid, however, that it must still be reckoned amongst the bad seasons. A vessel laden with timber was wrecked at Kilnsea in May and its cargo washed up all along the Point. The collection of this occupied the chief part of the nesting season, so that accidental destruction could hardly be avoided. The collectors, too, would gather many, for the position of the nests was frequently discussed by the labourers engaged, and it would be impossible to watch all. A visit to a Tern colony at the close of the nesting season will show clearly that the normal rate of infant mortality amongst Lesser Tern is very high. Considering the added dangers which attend the Spurn colony, it is surprising that it still exists.

With regard to the Oystercatcher (*Hæmatopus ostralegus*), I may mention that I saw a party of six on the Spurn on 24th June 1899; the most favourable locality for this species is, I think, outside the protected area.

I would call the attention of the committee to two other points. We ought to obtain the absolute protection of all shore birds on Sundays at present enjoyed by residents on the Norfolk coast. This would prevent the wanton destruction of Gulls and Herons on the Humber bank by Sunday sportsmen. It seems incredible that such an ideal district as South Holderness should possess no heronry of *Ardea cinerea*, though parties of twelve (from Lincolnshire, I believe) may frequently be seen on the Humber foreshore. The second concerns the Crested Grebe (*Podiceps cristatus*) on Hornsea Mere, whose number shows no increase. It is rumoured in Holderness that the eggs are taken every year by dealers who visit Hornsea expressly for that purpose.

NOTE—ORNITHOLOGY.

Red-crested Pochard in Cleveland.—I observe in 'The Naturalist' for October, p. 304, two notes of the occurrence of *Fuligula rufina* near Redcar; one above my signature and the other vouched for by Mr. J. W. Fawcett, of Satley.

It is evident they both refer to the same bird, which I obtained direct from the shooter. It was set up by Mr. G. Mussell, of Middlesbrough, and has not been in the possession of anyone else there.—T. H. Nelson, The Cliffe, Redcar, 3rd October 1900.

ADDENDA TO MISS STOW'S CATALOGUE OF THE FLOWERING PLANTS OF WOODHALL SPA.

JAMES COSMO MELVILL, M.A., F.L.S.,
Brook House, Prestwich, Manchester.

EIGHTEEN years ago, towards the middle of June 1882, I spent a few days at this health resort, preparatory to a tour in the Valais, Zermatt, etc., Switzerland, and compiled an MS. list, numbering between two and three hundred plants noticed. Of these I have eliminated all but the following sixty-four, which do not occur in Miss Stow's most interesting catalogue, and I think they are worth recording as a supplement to her enumeration, though so many are widely distributed and common. The ground traversed by me was limited to Horncastle on the north, Stixwould on the west, and southwards, Kirkstead Abbey. Whilst entirely agreeing with Miss Stow that but few rarities occur within this area, there are, notwithstanding, several local species amongst them, and the question of comparative infrequence is, after all, more than counterbalanced by the great and exquisite profusion of certain conspicuous flowers, imparting much beauty to the scene, at all events in the early summer time.

The only special notes, recorded at the time, which I find appended, are :—

(1) A reference to the extraordinary luxuriance of *Polygala vulgaris* L., notably the blue-flowered variety, more rarely white, some examples being as large as the form *grandiflora* Bab. from Ireland. Like Miss Stow, I did not notice any of the pink variety.

(2) A peculiar monstrous form of *Digitalis purpurea* L., gathered, if I remember right, in a hedge-row near Scrivelsby Hall, in which the corollas were uniformly about twice the natural size and spotted entirely over.

(3) *Lychnis diurna* Salisb. was very conspicuous by its absence, its place being taken by *L. vespertina* Salisb. (*alba* Mill.).

(4) A *Fragaria*, probably a large form of *F. chilensis*, was naturalised and exceedingly abundant not very far from Woodhall Station.

Ranunculus bulbosus L.
Fumaria officinalis L.
Viola odorata L.
On the Tattershall Road.

1900 November 1.

Viola Riviniana Reich.
Cerastium tetrandum Curt.
Cerastium arvense L.
Stellaria uliginosum Murr.
Arenaria trinervia L.
Hypericum hirsutum L.
Malva rotundifolia L.
Geranium pusillum L.
Geranium columbinum L.
Trifolium medium L.
Vicia angustifolia L.
Prunus domestica L.
Rubus cæsius L.
Geum rivale L.
Potentilla procumbens Sibth.
Rosa micrantha Sm.
Cratægus oxyacanthoides Thuill.
Saxifraga tridactylites L.
Saxifraga granulata L.
Sedum acre L.
Sanicula europæa L.
Apium repens Hook f.
Anthriscus sylvestris Hoffm.
Heracleum Sphondylium L.
var. angustifolium Huds.
Cornus sanguinea L.
Viburnum Opulus L.
Galium cruciata Scop.
Valerianella olitoria Poll.
Valerianella rimosa Bast.
Erigeron acre L.
Anthemis arvensis L.
Crepis biennis L.
Mariana lactea Hill. Kirkstead Abbey; locality shown me by the late Mr. John Burder.
Hieracium vulgatum Fr.
Hypochœris glabra L.
Primula acaulis L.
Primula veris L.
Fraxinus excelsior L.
Myosotis versicolor Reichb.
Digitalis purpurea L.
Veronica polita Fr.
Veronica Tournefortii C.Gmel.
Lamium purpureum L.
Rumex sanguineus L.
β viridis Sibth.
Rumex obtusifolius L.
Mercurialis perennis L.
Salix Caprea L.
Salix repens L.
Populus tremula L.
Pinus sylvestris L.
Tamus communis L.
Juncus conglomeratus L.
Luzula vernalis DC.
Luzula erecta Dix. v. congesta.
Potamogeton pusillus L.
Carex flacca Schreb.
(=glauca Murr.).
Carex flava L.
Carex hirta L.
Trisetum pratense Pers.
Avena pratensis L.
Bromus erectus Huds.

I may add that the Rev. E. Adrian Woodruffe-Peacock has kindly written me, asking that *Sieglingia decumbens* Bernh. may be added to the above list, it having been noticed by himself at Woodhall this summer (1900).

NOTES—FLOWERING PLANTS.

***Anchusa officinalis* near Louth.**—A single plant of *Anchusa officinalis* (Common Alkanet), in bloom, but fast going to seed, has been found by Mr. Kiddall growing on the highway in rough slag metalling in Keddington, near Louth. There is no other record for it in this district.—B. CROW, Louth, 2nd October 1900.

Arrowhead in East Cheshire.—The Common Arrowhead (*Sagittaria sagittifolia*), a rare plant in East Cheshire, grows profusely in many places in the Macclesfield Canal between Congleton and Gawsworth. The late Lord De Tabley in his 'Flora of Cheshire' gave only one station for it in the Northwich Hundred and none in the Macclesfield Hundred, the two divisions of the county in which this length of the canal lies.—CHAS. OLDHAM, Alderley Edge, 2nd October 1900.

LIST OF DIATOMS FOUND NEAR DONCASTER.

M. H. STILES, F.R.M.S.,

Doncaster.

The following list of fresh-water Diatoms is the result of the examination of many gatherings obtained from various localities in the neighbourhood of Doncaster during the past six years. The localities are arranged in groups and are indicated by initials, to which the following table serves as a guide :—

A. Askern, Wrancar Drain, Thorpe Brick-pond (7 miles).

C. Cusworth, Scawthorpe, and Bentley (2 miles).

D. Doncaster Town Water (from Firsby, Thrybergh, and Sheffield).

F. Firsby Reservoirs (7 miles).

H. Hatfield West Moor, Hatfield Brick-pond, Sandall Brick-pond, etc. (3 to 8 miles).

R. Roche Abbey and Stone (11 miles).

Ros. Rossington (5 miles).

Rh. Red House Pond, near the Race-course (2 miles).

The nomenclature and arrangement are those adopted in Van Heurck's 'Diatomaceæ,' 1896. Occasionally older synonyms are inserted where it was thought that they would prove useful. Those species and varieties marked thus (*) do not appear, as far as I am able to trace, in the list of Diatoms in Lees' 'Flora of West Yorkshire.' I wish here to express my indebtedness to Mr. W. West, F.L.S., and to Mr. J. Newton Coombe for valuable help most freely rendered from time to time in the compilation of this list, which, incomplete though it be, will yet serve as the basis of a fairly representative local record.

Amphora ovalis (Kutz.).		A.	C.		F.	H. R. Ros.
Var. ***affinis.***	*		C.			
Var. ***pediculus.***	*			D.	H.	R.
Cymbella Ehrenbergii (Kutz.).	*		C.			
Cymbella cuspidata (Kutz.).		A.	C.			
Var. ***naviculiformis.***	*		C.		H.	R.
Cymbella subæqualis (Grun.).	*		C.			
Cymbella delicatula (Kutz.).	*		C.			

1900 November 1.

Cymbella gastroides (Kutz.). (*Cocconema gastroides*).		A.		F.	H.			
Cymbella lanceolata (Ehr.). (*Cocconema lanceolata*).		A.	C.	D.	F.	H.	R.	Ros.
Cymbella cymbiformis (Ehr.). (*Cocconema cymbiforme*).		A.	C.	D.	F.		R.	
Var. ***parva.*** (*Cocconema parvum* Wm. Sm.).		A.		D.				
Cymbella Cistula (Hempr.). (*Cocconema cistula*).	*	A.	C.	D.	F.	H.	R.	Ros.
Var. ***maculata.*** (*Cocconema maculatum* Kutz.).	*				F.			
Encyonema prostratum (Ralfs.).					F.	H.	R.	
Encyonema cæspitosum (Kutz.)					F.	H.	R.	Ros.
Mastogloia Smithii (Thwaites).	*	A.						
Stauroneis phœnicenteron (Ehr.).		A.	C.			H.		
Stauroneis anceps (Ehr.).				D.		H.	R.	
Stauroneis Smithii (Grun.).	*							Ros.
Stauroneis gracilis (Ehr.).	*					H.		
Navicula nobilis (Ehr.). (*Pinnularia nobilis*).	*	A.						
Navicula major (Kutz). (*Pinnularia major*).		A.	C.		F.	H.		
Navicula viridis (Kutz.) (*Pinnularia viridis*).		A.	C.	D.	F.	H.	R.	Ros.
Var. ***commutata***	*	A.		D.				
Navicula cruciformis (?) (Donk.). Fragment only. (*Pinnularia cruciformis*).	*			D.				
Navicula appendiculata (?) (Kutz.).	*			D.				
Navicula legumen (Ehr.).	*			D.	F.			
Navicula oblonga (Kutz.). (*Pinnularia oblonga*).		A.	C.			H.	R.	
Navicula peregrina (Kutz.)	*					H.		Ros.
Navicula gracilis (Kutz.).	*		C.		F.		R.	
Var. ***neglecta*** (Thwaites).	*						R.	
Navicula radiosa (Kutz.). (*Pinnularia radiosa*).		A.	C.	D.	F.	H.	R.	Ros.
Var. ***acuta.***			C.				R.	

Navicula viridula (Kutz.). A.C. R.
(*Pinnularia viridula*).

Navicula rhynchocephala (Kutz.) D. R.

Navicula cryptocephala (Kutz.). * R.

Navicula humilis (Donk.). H. Ros.
(*N. inflata* Wm.Sm.).

Navicula Reinhardtii (Grun.). H.

Navicula elliptica (Kutz.). A.C. F.H.R.

Var. ***ovalis.*** C.D.

Navicula granulata (Bréb.),

Var. ***maculosa.*** * Ros.

Navicula cuspidata (Kutz.) A.C. F.H.R.Ros.

Navicula ambigua (Ehr.). * F. Ros.

Navicula sculpta (Ehr.). * A.

Navicula serians (Bréb.). * H.

Navicula exilis (Grun.). * A. D.F.H. Ros.

Navicula latiuscula (Kutz.). * H.

Navicula amphisbœna (Bory). A.C. H.R.

Navicula limosa (Kutz.). * A. F.H.R.Ros.

Navicula Iridis (Ehr.) R.

Var. ***firma*** (Kutz.). A.

Var. ***affinis.*** R.

Var. ***producta.*** R.

Var. ***amphirynchus.*** H. Ros.

Navicula semen (Ehr.). * H.

Navicula lanceolata (Kutz.). C.

Navicula dicephala (Wm.Sm.) * D.

Navicula Anglica (Ralfs, 1861). * R.
(*Navicula tumida* Wm.Sm., 1853).

Navicula pygmæa (Kutz.). * C.

Colletonema lacustre (Ag.). * H.

Amphipleura pellucida (Kutz.). A. H.R. Rh.

Pleurosigma attenuatum (Wm.Sm.). A.C.D.F.H.R.

Var. ***scalprum.*** H.

Pleurosigma acuminatum (Kutz.Grun.) A. R.
(*Pleurosigma lacustre* Wm.Sm.).

Pleurosigma Spencerii (Wm.Sm.). * C. F.H.

Pleurosigma scalproides (Rab.).	*					H.		
Gomphonema constrictum (Ehr.)		A.		D.	F.	H.	R.	Ros.
Var. ***capitatum.***				D.		H.		
Gomphonema acuminatum (Ehr.).		A.	C.	D.	F.	H.		Ros.
Var. ***coronatum.***				D.				
Gomphonema montanum (Schum.),								
Var. ***commutatum.***	*	A.		D.	F.			Ros.
Gomphonema intricatum (Kutz.).	*	A.	C.		F.	H.		
Var. ***vibrio.***	*	A.						
Gomphonema olivaceum (Kutz.).								Ros.
Gomphonema geminatum (Lyngb.).		A.						
Rhoicosphenia curvata (Grun.).						H.	R.	Ros.
(*Gomphonema curvatum*).								
Achnanthidium flexellum (Bréb.).		A.	C.					
Achnanthes exilis (Kutz.)	*		C.			H.	R.	
Achnanthes lanceolata (Bréb.).	*	A.						
Cocconeis pediculus (Ehr.).			C.			H.		Ros.
Cocconeis placentula (Ehr.).		A.			F.	H.	R.	Ros.
Var. ***lineata.***	*							Rh.
Epithemia turgida (Ehr.).		A.				H.		Rh.
Var. ***granulata.***	*							Rh.
Epithemia gibba (Kutz.).	*	A.		D.		H.		Rh.
Var. ***ventricosa.***	*						R.	Rh.
Var. ***parallela.***	*	A.						
Epithemia Sorex (Kutz.).	*					H.		
Epithemia Zebra (Ehr.)	*	A.				H.		Rh.
Eunotia Arcus (Ehr.).		A.	C.				R.	
Var. ***minor*** (V.H.).	*					H.		Ros.
Var. ***bidens*** (V.H.).	*	A.					R.	
Eunotia pectinalis (Kutz.).					F.			
(*Himantidium pectinale*).								
Var. ***ventricosa.***	*			D.		H.		
Var. ***undulata.***							R.	
(*Himantidium undulatum*).								
Eunotia gracilis (Ehr.).						H.		Rh.
(*Himantidium gracile*).								
Eunotia lunaris (Ehr.).	*			D.	F.	H.		
Eunotia robusta (Ralfs.),								
Var. ***tetraodon.***	*			D.				

Eunotia monodon (Wm.Sm.).	*				R.			
Eunotia exigua (Bréb.).	*	A.						
Eunotia flexuosa (Kutz.),								
Var. ***bicapitata.***	*			H.				
Synedra pulchella (Kutz.).	*		D.	F.	H.			
Synedra Ulna (Nitzsch).		A.	C.	F.	H.	R.	Ros.	
Var. ***subæqualis.***	*			H.				
Var. ***splendens.***				F.				
Var. ***amphirynchus.***	*		D.					
Synedra Acus (Kutz.).	*			H.		Ros.		
Synedra radians (Kutz.).	*	A.	C.		H.			
Synedra capitata (Ehr.).		A.			H.			Rh.
Asterionella formosa (Hassall).		A.						
Fragilaria capucina (Desmaz.).		A.	C.		H.	R.	Ros.	
Var. ***mesolepta.***	*			F.				
Fragilaria construens (Ehr.).	*		D.		H.		Ros.	
Diatoma vulgare (Bory).		A.	C.			R.	Ros.	
Diatoma elongatum (Ag.).			C.	F.	H.	R.	Ros.	
Odontidium Harrisonii (Wm. Sm.).			C.			R.		
Odontidium mutabile (Wm. Sm.).			C.			R.		
Odontidium parasiticum (Wm. Sm.).						R.		
Denticula tenuis (Kutz.).	*	A.	C.		H.			
Meridion circulare (Ag.).			C.	D.	H.	R.		
Tabellaria flocculosa (Roth).				D.	H.			
Cymatopleura elliptica (Bréb.).		A.	C.		H.		Ros.	
Var. ***hibernica.***	*			F.	H.			
Cymatopleura Solea (Bréb.).		A.	C.	F.	H.	R.	Ros.	
Cymatopleura apiculata (Wm.Sm.).	*					R.		
Surirella biseriata (Bréb.).			C.			R.		
Var. ***parva.***					H.			
Surirella robusta (Ehr.),								
Var. ***splendida.***	*			D.			Ros.	
Surirella ovalis (Bréb.).		A.		D.	F.	H.		
Var. ***Crumena.***					F.		Ros.	
Var. ***ovata.***							Ros.	
Var. ***angusta.***			C.					
Var. ***pinnata.***							Ros.	

Surirella spiralis (Kutz.). (*Campylodiscus spiralis* Wm.Sm.).		A.				
Surirella linearis (Wm.Sm.).	*				R.	
Campylodiscus Hibernicus (Ehr.). (*Campylodiscus costatus* Wm.Sm.).		A.C.				
Hantzschia amphioxys (Ehr.). (*Nitzschia amphioxys* Wm.Sm.).		A.C.	D.		R.	Ros.
Nitzschia angustata (Wm.Sm. Grun.)	*				R.	
Nitzschia Tryblionella (Hantzsch.). (*Tryblionella scutellum* Wm.Sm.).			D.	F.	R.	Ros.
Nitzschia circumsuta (Bailey. Grun.).	*	A.				
Nitzschia vermicularis (Kutz.).	*			H.		
Nitzschia dubia (Wm.Sm.).				F.H.		Ros.
Nitzschia sinuata (Wm. Sm.).	*	A.				
Nitzschia sigmoidea (Ehr.).		A.C.		F.H.		Ros.
Nitzschia fasciculata (Grun.).	*			H.		
Nitzschia palea (Kutz.).	*			H.		
Nitzschia acicularis (Wm. Sm.).	*			H.		
Nitzschia linearis (Ag.).				H.		
Nitzschia sigma (Grun.), Var. ***sigmatella.*** (*N. curvula* (Ehr.).			D.			
Nitzschia vitrea (Norman), Var. ***recta.***	*			H.		
Melosira varians (Ag.).		A.	D.	F.	H. R.	Ros.
Melosira arenaria (Moore).					R.	
Cyclotella comta (Ehr.)	*		D.			
Cyclotella operculata (Kutz.).		C.	D.			
Cyclotella Kutzingiana (Chauvin).	*	A.C.			H.R.	

NOTE—ENTOMOLOGY.

Insects taken at Ashby, Lincolnshire.—The following insects were taken by me during the season of 1899 in the parish of Ashby, Div. 2 of North Lincolnshire, and kindly named by the Rev. Alfred Thornley, M.A., F.L.S.:—

ORTHOPTERA.

Forficula auricularia (Earwig).

TRICHOPTERA.

Limnophilus lunulatus (Caddis-fly).

HEMIPTERA-HETEROPTERA.

Lygus pratensis.

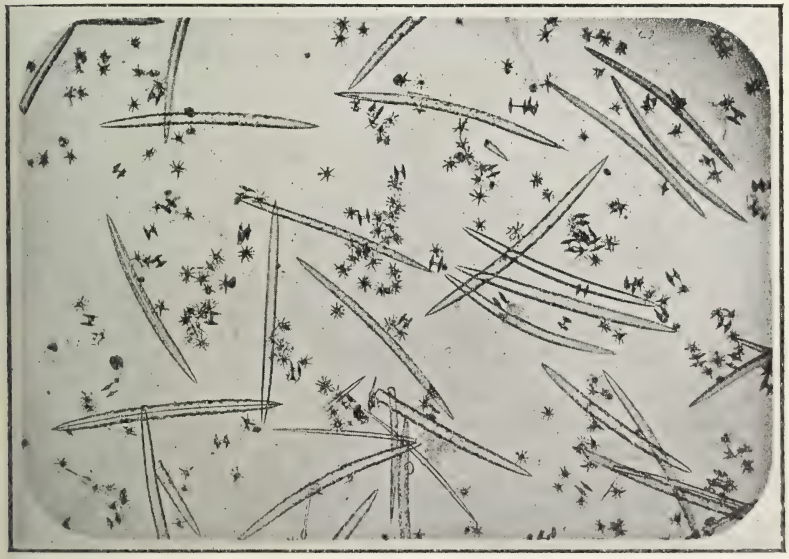
Acanthosoma interstinctum (=*griseum*).

—R. T. CASSAL, Ashby, Doncaster, 3rd Sept. 1900.

Naturalist,

NOTE—SPONGES.

Freshwater Sponges in Yorkshire.—In the July 1898 number of 'The Naturalist' Mr. Ll. J. Cocks asks for records of Freshwater Sponges in Yorkshire and the Northern Counties generally. In my examination of the Diatomaceous gatherings, obtained from various sources within a radius of 10 or 12 miles from Doncaster, I have on several occasions come across indications of the presence of both *Spongilla lacustris* and *S. fluviatilis*. (Found at Stone, near Roche Abbey, July 1899; in a sediment from Doncaster water, August 1898; and at Askern Bog, January 1898.) Probably the most notable instance occurred in treating a sub-fossil deposit from the borders of Askern Bog with the view of determining the Diatoms present. Both the bi-rotulate spicules of *S. fluviatilis* and the fusiform ones of *S. lacustris*



were met with in this case in considerable numbers, and were a source of much interest. In endeavouring to gain additional information on this subject my friend, Dr. Corbett, secured a fragment of a deposit taken from the Manchester Reservoir about 30 years ago by Mr. Thomas Rogers, who had been commissioned to investigate the cause of a serious trouble with the Manchester water supply. This trouble was found to be due in a great measure to an excessive growth of Freshwater Sponges in the reservoir. From the deposit which came into my posession I succeeded in making a most interesting and characteristic slide of Sponge Spicules, of which I enclose a photo-micrograph. Both varieties of Spicules are present in vast numbers, and, as a glance at my photograph will show, the gathering is a wonderfully pure one.—M. H. STILES, Doncaster, 28th August 1899.

NOTE—FISHES.

Rainbow Trout: a Query.—The Horncastle Angling Association have gone to considerable expense in introducing Rainbow Trout into the river Bain. These fish are believed to be migratory, and the money may thus have been spent in vain. Can any readers of 'The Naturalist' give any information on this subject.—J. CONWAY WALTER, Langton Rectory, Horncastle, 16th October 1900.

NOTE—FUNGI.

'Large Fairy Rings at Fillingham Castle, Lincolnshire.'—It is very unusual to see 'fairy rings' attain so great a circumference as mentioned by Mr. Burton in last month's 'Naturalist.' It is stated that these 'rings' commence to form from a common centre, which no doubt they do. Year after year the circle is enlarged as the mycelium of the fungus travels radially further afield. Probably, as the mycelium exhausts the soil of food suitable to itself, it continues to advance in search of more, and thus extends its sphere of operations. If we may judge from the robust look of the grass forming the rings, the presence of the mycelium amongst its roots does not appear to exercise any injurious effect upon it. On the contrary, may it not render some of the soil contents more suitable for absorption by the grass roots, and thus be of real benefit to them?

Some able student might work out this problem, if it has not already been done, as probably it has. At any rate, it would be interesting if some one favourably located would take the trouble to note the annual increase of diameter made in a few such rings, also whether any other kind of Agarics inhabited them besides *Marasmius oreades*. Other observations, if accurately taken—such, for instance, as altitude, level or incline of field (pasture or meadow), open or shaded, moist or dry, kind of soil, etc.—would add to the interest.—C. CROSSLAND, Halifax, 3rd October 1900.

NOTES—FLOWERING PLANTS.

Alien Plants: a Query.—In regard to the list of alien plants in Lincolnshire, it would interest some of your botanical readers to know on what grounds Mr. Woodruffe-Peacock names as Alien (see Oct. number of 'The Naturalist') *Lepidium ruderale* and *Chenopodium vulvaria*. In J. E. Smith's botany they are not marked 'vix indigena,' his usual phrase when doubtfully native. Smith's references of these two species are to Hudson, Ray (1790), and Withering.—H. PAYNE, Newhill Hall, 3rd October 1900.

Alien: A Definition.—The late Hewett Cottrell Watson's definitions of Denizen, Colonist, and Alien are what all botanists use in Britain, and far beyond our shores. They are from the 'Cybele Britannica,' and run as follows:—

'A *Denizen* is a species suspected to have been introduced by man, and which maintains its habitat.

'A *Colonist* is one found only in ground adapted by man for its growth and continuous maintenance.

'An *Alien* has presumably been introduced by human agency.'

These general rules cannot, however, be followed without careful consideration in any particular case. A plant may be a Native of England and Alien in any given spot. *Trifolium ochroleucon* is such if found anywhere except in the eastern counties south of the Humber. A species may be Native on a given soil and Alien if found growing on others in a given county. *Trifolium ochroleucon* is Native on the boulder-clay soils in Lincolnshire, and Alien elsewhere; while *Potentilla argentea* is only Native on the Spilsby sandstone. In this county, too, *Atropa*, *Hyoscyamus*, and the *Verbascums*, with a large number of others, are most certainly Denizens. All the *Papaver, Diplotaxis*, and *Erysimum* are Colonists. Quite a vast number are Alien, for the sake of example, *Vicia lutea, V. lævigata, V. hybrida, Caucalis latifolia, C. daucoides, Mentha viridis*, and *Salvia pratensis*. To this latter class belong *Chenopodium pseudo-botryoides* and *C. vulvaria, Fæniculum* and the *Lepidiums* I named in a short list on p. 299 of 'The Naturalist' for 1900. They are only found at Grimsby on made ground with scores of foreign Aliens, many of which still require naming, quite away from their native habitats. After using the Drift Maps for ten years, and studying species wholly from the point of view of soils in botanising, I am generally in a position now to say where a species can grow naturally and where it cannot on the soils of Lincolnshire.—E. ADRIAN WOODRUFFE-PEACOCK, Cadney, Brigg, Lincolnshire, 20th October 1900.

THE CONSTITUENTS OF THE NORTH LANCASHIRE FLORA, 1597(?)-1894.

S. LISTER PETTY,

Ulverston.

NINETEENTH PAPER.

By an accident a portion of the MS. of the Eighth Paper was lost. It contained the Crassulaceæ and Droseraceæ supplied here, and readers are requested to note reference in the list of April 1896.

Cotyledon Umbilicus L. Clarke's First Record, 1562.
Umbilicus pendulus.

1843. Jopling, Furness and Cartmel, 261. On moist rocks near Backbarrow and Ulpha, Aiton and Wilson. **1869.** Aspland's Guide. Within six miles of Grange, A. Mason. **1874.** J. of B., Miss E. Hodgson. Old wall at Arrad Foot; and repeated, with Aiton and Wilson, in **1885.** Baker's Flora, 101.

Sedum Rhodiola DC. *Rhodia radix.* C.F.R., 1597.

1666. Merrett, Pinax, 104. On the moist rocks in Farn-Fels, in the bottom of Lancashire on the highest fel towards Hawkshead; and repeated, **1667.** Pinax, 104. **1787.** Withering, ed. 2, 1124, as *Rhodiola rosea.* Coniston Old Man, Woodward; and repeated, **1796.** Withering, ed. 3, 389, and 'Mr. Rigge's slate quarry in Coniston,' Jackson; and in all subsequent eds. of Withering. **1805.** Turner and Dillwyn, Bot. Guide, II., 272; Merrett repeated. **1835.** Watson, New B.G., I., 562; Merrett repeated but ascribed to 'B.G.'; and in **1840.** Baxter, Phænog. Bot., Vol. 5, 391. **1882.** J. of B., 347. Cliffs on the Old Man, W. F. Miller. **1885.** Baker's Flora, 99. 'First recorded by Merrett.' **1888.** Westm. Notebook, 81; Merrett repeated in Martindale's 'Early West. Pl. Rec.'

Sedum Telephium L. C.F.R., 1597.

1843. Jopling, Furness and Cartmel, 261. Between Cark and Flookborough, Wilson. **1861.** Phytologist, 238. East side of Humphrey Head, C. J. Ashfield. **1864.** Linton, Lake Country, 322. 'Common,' no locality. **1869.** Aspland's Guide. Within six miles of Grange, A. Mason. **1874.** J. of B., Miss E. Hodgson. Old walls about Furness Abbey; in an old hedge near Ulverston; Low Waterhead, Coniston.

1900 November 1.

VAR. ***purpureum*** Tausch.

1874. J. of B., Miss E. Hodgson. In a wall near Haverthwaite. **1885.** Baker's Flora, 99. Both type and var., ascending from Humphrey Head (to 300 yards in Borrowdale).

Sedum villosum L. C.F.R., 1666.

1843. Jopling, Furness and Cartmel, 262. In the clefts of the rocks in High Furness, Aiton; and repeated, **1885.** Baker's Flora, 100.

Sedum album L. C.F.R., 1634.

1843. Jopling, Furness and Cartmel, 261. Long Scar, near Holker, W. Wilson.

Sedum anglicum Huds. C.F.R., 1670.

Sedum minimum non acre flore albo.

1670. Ray, Cat. Pl. Ang., 280. Nec minus abundat in rupibus Westm. et Lancs. prope lacum Winandermere; and repeated, **1677.** Ray, Cat., ed. 2, 270-71; **1690.** Ray, Syn., ed. 1, 150; **1693.** Ray, Hist., II., 1041; **1696.** Ray, Syn., ed. 2, 153; **1724.** Ray, Syn., ed. 3, 270; **1762** and **1778.** Hudson, Flora Ang. **1775.** Jenkinson, Desc. Brit. Pl., 95. **1772.** Robson, Flora, 152. **1835.** Watson, New B.G., I., 300. Lancashire, on rocks (Eng. Fl.). (But what Smith says is, ' . . . and rocks in Lancs. and Westm., Ray')]. **1843.** Jopling. Furness and Cartmel, 262. Near Bardsea, Aiton. **1864.** Linton, Lake Country, 322. 'Common,' no locality. **1874.** J. of B., Miss E. Hodgson. Hills about the town of Ulverston; on the rocks everywhere, Seathwaite Fells. **1885.** Baker's Flora, 100, Miss Hodgson repeated. Windermere; Coniston Old Man. **1889.** Westm. Notebook, 82. Ray repeated in Martindale's Early Westm. Pl. Rec.

Sedum acre L. C.F.R., 1538.

1832. Loudon, Gard. Mag., 529. 'A native of the Lake District,' Joshua Major in a notice of the Esthwaite neighbourhood. **1861.** Phytologist, 238. Between Humphrey Head and Cartmel, C. J. Ashfield. **1864.** Linton, Lake Country, 322. Common, no locality. **1874.** J. of B., Miss E. Hodgson. Walls, frequent, from the shores upwards. **1885.** Baker's Flora, 100. Ascending from the sands of the Furness shore.

Sedum sexangulare L.

1885. Baker's Flora, 100. Walls at Grange-over-Sands, J. G. Baker.

Sedum reflexum L.

1874. J. of B., Miss E. Hodgson. On on old garden wall at Newfield, Seathwaite; and repeated. **1885.** Baker's Flora, 100; and Allithwaite, J. G. Baker.

Sedum rupestre Huds. C.F.R., 1666.

1846. Phytologist, 430. 'Possibly wild, grows about the edge of the lake (i.e. Windermere), not far northward from the Ferry,' W. Borrer. **1874.** J. of B., Miss E. Hodgson. Walls at Broughton-in-Furness (introduced); and this repeated, **1885.** Baker's Flora, 101. **1892.** Naturalist, 83, Miss Hodgson; repeated as seen. Walls at Hartley Ground, near Broughton-in-Furness, L. P.

Drosera rotundifolia L. C.F.R., 1568.

1843. Jopling, Furness and Cartmel, 259. Bogs in Furness and Cartmel, Aiton and Wilson. **1864.** Linton, Lake Country, 319. 'Common,' no locality. **1869.** Aspland's Guide. Within six miles of Grange, A. Mason. **1874.** J. of B., Miss E. Hodgson. Common in bogs.

Drosera anglica Huds. C.F.R., 1640.

[**1828.** Smith. Eng. Fl., ed. 2, vol. 2, 123. In Lancashire, Dr. Hall. Possibly this means Warrington.] **1882.** J. of B. Stickle Pike in Dunnerdale, W. F. Miller; and repeated, **1885.** Baker's Flora, 44.

Drosera intermedia Hayne. C.F.R., 1660.

1843. Jopling, Furness and Cartmel, 259, as *longifolia*. Rudasey mosses, rare, Wilson. **1869.** Aspland's Guide, as *longifolia*. Within six miles of Grange, A. Mason. **1874.** J. of B., Miss E. Hodgson. Plumpton and other low-lying mosses, abundant. **1885.** Baker's Flora, 43-4. Aiton and Miss Hodgson repeated. Pools at Coniston Tarns, Miss S. Beever. Now known as Tarn Hows. The tarns are now, so far as possible, joined together.—L. P.

NOTE—FLOWERING PLANTS.

***Arctostaphylos Uva-ursi* in Yorkshire Folk-Medicine.**—A Sheffield friend, during a walk across the wild moors between Langsett and Ashopton, in the early part of last month, noticed this rare plant in some quantity and gathered specimens for me. His attention was called to it by the fact that some men (presumably herbalists) were collecting it into bundles, their explanation being that it was '*Uva-ursi*,' and 'an excellent thing for the back.' The exact locality is between 'Slippery Stones' and the Derwent, about one hundred yards away from the stream, and on the Yorkshire side. —A. E. Bradley, Leeds, 2nd October 1900.

NOTES—LEPIDOPTERA.

***Acherontia atropos* near Kendal.**—Messrs. J. and G. Holmes and Mr. Moss, of the Kendal Entomological Society, have taken seven larvæ of this species in the Natland and Foulshaw districts this season.—HARPER GAYTHORPE, Barrow-in-Furness, 7th October 1900.

***Colias hyale* in the Isle of Man.**—My eldest boy, Erik, captured a specimen on the Isle of Man Railway, between Port Erin and Port St. Mary, about 21st August last. The variety was *hyale*.—JAMES W. ADDYMAN, 15, East Parade, Leeds, 23rd October 1900.

***Colias edusa* in Westmorland.**—At a meeting of the Kendal Entomological Society it was reported that five examples of the Clouded Yellow Butterfly had been captured, and others seen, near Kendal, by Messrs. N. Robinson, A. Winder, A. Duncan, and G. Wilkes. This is especially interesting, as fourteen years have elapsed since the species were last taken near Kendal.—HARPER GAYTHORPE, Barrow-in-Furness, 7th October 1900.

Hummingbird, Death's Head, and Convolvulus Hawkmoths in East Cheshire.—The Hummingbird Hawkmoth (*Macroglossa stellatarum*) has again been in evidence in this district during the past summer. On 17th July I watched one hovering over some honeysuckle at Siddington, and several others have been captured or seen at Alderley Edge and Wilmslow. On 10th September I was shown a full-fed larva of the Death's Head Hawkmoth (*Acherontia atropos*), one of two which had been taken at the Hough, Alderley Edge, a few days before. A Convolvulus Hawkmoth (*Sphinx convolvuli*) was found crushed between the sash and frame of a window in a house at Alderley Edge on 27th September. It had evidently settled on the woodwork and had been killed when the window was closed on the previous morning.—CHAS. OLDHAM, Alderley Edge, 2nd October 1900.

NOTES—HYMENOPTERA.

***Sirex gigas* at Horncastle.**—Two specimens of this rather uncommon insect have been found at Horncastle. They are specially peculiar, because one is more than one inch in length, and the other barely half an inch, probably from the log in which it was buried becoming too dry and it lacked nourishment.—J. CONWAY WALTER, Langton Rectory, Horncastle, 3rd August 1900.

***Sirex gigas* at Beverley.**—During the last month two specimens of *Sirex gigas* have been taken at Beverley. One was taken on 19th August and is now in my possession; the other was received by Mr. J. T. Legard, who also preserved the specimen. I have two specimens of this insect, taken near Beverley in 1894 and 1899, and in 1897 I received *S. juvencus*, which was taken in the town.—J. R. LOWTHER, Crane Hill, Beckside, Beverley, 17th September 1900.

Hymenoptera taken at Ashby, Lincolnshire.—The following species were taken by me during the season of 1899 in the parish of Ashby, Div. 2 of North Lincolnshire, and kindly named by the Rev. Alfred Thornley, M.A., F.L.S.:—

ACULEATA.	TENTHREDINIDÆ.
Vespa germanica. ♀ and ☿.	*Athalia rosæ.*
Andrena trimmerana. ♀ (var. of *rosæ*).	*Dolerus æneus.*
Andrena gwynana. ♀.	*Sirex juvencus.* ♀.
Bombus agrorum.	*Rhogogastera viridis.*

—R. T. CASSAL, Ashby, Doncaster, 3rd September 1900.

Naturalist,

FUNGUS FORAY AT MULGRAVE WOODS, WHITBY, 15TH TO 21ST SEPTEMBER 1900.

CHARLES CROSSLAND, F.L.S.,
Halifax; *Hon. Sec. Yorkshire Mycological Committee.*

THE ninth Annual Fungus Foray in connection with the Union opened at Whitby on Saturday, 15th September, and continued until the following Friday. The first day was set apart by the Union for general work in the neighbourhood of Sandsend, Mulgrave Woods, and the adjoining coast line. The botanists made their way to Mulgrave Woods, permission to investigate which had been obtained from the Marquis of Normanby. Few mycologists having been able to arrive in time for that day's work, Mr. U. Bairstow, Halifax, and Mr. Thomas Hey, Derby, undertook to pay special attention to fungi, and brought a most interesting collection to the headquarters of the Mycological Committee at Nineteenlands Farm, near Lythe. The other members of the committee who put in an appearance were Messrs. G. Massee, F.L.S., Royal Herbarium, Kew, President; A. Clarke, Huddersfield; Thos. Gibbs, Sheffield; James Needham, Hebden Bridge; and C. Crossland, F.L.S., Halifax, Convener.

The headquarters proved to be most comfortable and convenient in every way, closely adjoining what is, perhaps, the best portion of those grand old woods for fungi. This proximity much facilitated the work, no great distances being to travel either at the beginning or finish of each day's work, abundant material of all kinds being comparatively close at hand. It had been thought that a visit to Arncliffe or Egton Woods on one of the days would be necessary to fill up the week, but so prolific did Mulgrave prove, in park and woodland, that any idea of visiting other places was abandoned early in the week. This change could easily be effected, as no 'hard and fast' arrangements, which often cramp operations, had been made.

Different parts of the woods were visited each day, so that a more general knowledge of their fungal-flora might be obtained. Day after day each part was found to contain something of special interest not found in the others; in all parts good bags were readily secured.

Amongst the Agarics of the Leucosporous section a few genera were not at all well represented. Only three out of about twenty British *Amanitæ* were met with. *Tricholoma*, comparatively, about the same. *Collybia* a little better. *Clitocybe* much worse, only six out of fifty-two. In some genera,

while species were few, certain individuals abounded; *Tricholoma stans,* a species usually rare everywhere, and *T. terreum* were very plentiful. The sight of the elegant *T. inamœnum* was limited to just a couple of specimens. The only *Armillaria* seen was, of course, *A. mellea,* and it was all over the place, both in typical tufts at the base of trunks and in isolated individuals arising from strands of mycelium which had followed the ramifications of infested tree roots. Some remarkably fine specimens of *Lepiota procera* were seen in the deer park, measuring 9 in. to 10 in. across the pileus, and, with stems 12 in. to 14 in. long, they looked like miniature Japanese parasols stuck in the ground. The *Hygrophoræ* were in good force, one-third of the whole number of British species being secured. Strange to say, only a single specimen of *Paxillus involutus* was seen. *Marasmius Hudsoni*, with its peculiar spinose pileus and stem, was plentiful on fallen holly leaves in various parts of the woods.

One feature in the Rhodosporeæ was the prevalence of little groups of *Eccilia atropuncta*, a pretty species with decurrent gills and black-dotted stem, and another the finding of *Entoloma speculum*.

In the Ochrosporeæ the *Inocybæ* and *Cortinarii* largely predominated both in species and individuals; the charming little *I. geophylla* being particularly plentiful. Only one *Flammula* was collected. *Crepidotus* supplied us with a species new to the European flora. It is a North American form known as *C. putrigenus* Berk.&Curt. It was growing from the sides and sawn end of a log almost buried in bracken.

The Porphyrosporeæ and Melanosporeæ were about an average.

The Polyporaceæ upon the whole were not too well represented, judging, of course, from the specimens met with. *Merulius lachrymans* (dry rot) was found almost completely enveloping a large stump in the heart of the woods, the spores covering the ground with a rich brown powder. This discovery is interesting, as Hartig, in his 'Diseases of Timber Trees,' states that this species is exceedingly rare in the forest, being more especially confined to wood in use in the structure of buildings.

The Hydnaceæ were very limited in numbers. In the Thelephoraceæ fine specimens of *Craterellus cornucopioides* were found in quantity. A lovely little batch of *Solenia maxima* Mass. fell to the lot of Mr. Gibbs.

The moist clayey banks in the woods appeared to be appreciated by the Clavariæ; of these no fewer than thirteen species were gathered, including a stranger which is being worked out. Tremellineæ were few, as were also the Gastromycetes. Not many species of parasitic fungi were noted; probably there were more, but not seen. *Rhytisma acerinum* was extremely prevalent on sycamore leaves; even seedlings had their very first pair of real leaves blotched by it. Primrose plants were so rank that one felt sure of being able to find its leaf disease *Puccinia primulæ*, and there it was. *Phragmidium mucronatum*, along with a few other things, was seen on a cultivated rose tree in the lodge garden at Lythe. A stroll into an adjoining garden resulted in the haulms of some diseased potatoes being boxed for closer examination; on these were found *Vermicularia atramentaria* B. & Br., *Volutella ciliata* Fr., and *Colletotrichum lycopersici* Chester. Respecting the latter Mr. Massee reports as follows:—'*Colletotrichum lycopersici* Chester, now for the first time recorded as a European fungus, is recognised as a parasite on tomatoes in the United States. In this country it was first observed as a destructive parasite on potato-haulms in a field near Worcester a few weeks ago (August 1900), and has since been observed on the same host, which it had killed, in a cottage garden at Lythe. The diseased stems are blackened as if scorched, and as they were left on the ground the probability, almost amounting to a certainty, is that not only will the disease appear again next season, but that it will also extend its range.'

The smaller Discomycetes were fairly abundant, and included two very special things, viz., *Dasyscypha Richonii* Mass. = *Trichopeziza Richonii* Sacc., new to Britain, and *Diplocarpa Curreyana* Mass. = *Peziza diplocarpa* Currey. The fortunate find by Mr. Gibbs of this apparently rare and most peculiar Discomycete affords an opportunity of confirming the accuracy of the author's original description of the character and length of the spores. Subsequent descriptions, taken from herbarium material, have, from some cause or another, extended the length a little beyond the real. There does not appear to have been any other record since Currey first found it at Joyden's Wood, Dartford, until the present.

There was an almost entire absence of the larger Peziæ, excepting the somewhat local *Galactinia succosa*.

On account of the immense quantity of fallen timber and branches Pyrenomycetes will abound in the early part of any

year. The same feature of the woods is also very favourable to the prolific production of Myxogastres. *Tubulina cylindrica* was seen almost covering a prostrate trunk with its purple-brown cushions. Many of the smaller species were also very profuse and wide spread, *Tilmadoche nutans* in particular.

Syzygites megalocarpus = *Sporodinia aspergillus* was seen in abundance on decaying fungi, both in the sporangiferous and zygospore condition.

As nature more and more delivers up her secrets in the laboratory to the attacks of such workers as Professor H. Marshall Ward, F.R.S., Harold W. T. Wager, F.L.S., and others, one is more and more impressed with the great part played by fungi, for good or ill, in nature's economy. The knowledge of fungi, including their distribution and prevalence, is still very limited in comparison to what yet remains to be done, notwithstanding the immense amount of work effected by Berkeley and others. The field-man, the systematist, and the laboratory student have yet plenty of work before them in all their respective lines.

It is to be feared the mistaken notion is very prevalent that the main object of a fungus foray is a sort of semi-social meeting of kindred spirits with the one object of forming a list of the toadstools of a given district, or at most to hunt up a few special or very rare species. It is hoped, however, that the accompanying notes and records indicate that the members went deeper into the subject, and had a much more important object in view. Microscopic as well as the larger fungi were investigated. In addition, a large amount of valuable material from the biologist's standpoint was found and spirit material at once secured. Mulgrave is a rich district for a mycologist, and would furnish a fine field for a local student. Judging by the present four to five days' visit, it is estimated that, at the very least, a thousand species may be found in the woods and adjoining parks and pastures. Mulgrave Woods were visited in 1894, when many most interesting things were found, and a longing created that another opportunity might be afforded for a second visit. Unfortunately the 1894 records were not printed in 'The Naturalist,' but will be incorporated in a catalogue of the Yorkshire Fungus Flora now in course of preparation, to be issued by the Union.

The season upon the whole has been an exceptionally good one for fungi. Short, heavy rains, alternating with spells of

heat, have apparently been conducive to their growth. These conditions appear to have been remarkably favourable throughout the country to the growth of the Horse Mushroom, *Agaricus arvensis,* and the giant puff-ball, *Lycoperdon bovista*; scores upon scores of both were seen in the fields bordering the railway between Malton and Whitby. A correspondent in Bedfordshire had noticed the same feature in that county, and forwarded fine specimens of the Horse Mushroom. Another correspondent, Mr. H. Slater, of Helmsley, sent a photograph of two puff-balls weighing 6½ lbs. and 7 lbs. respectively, one being 44 in. in circumference; later, one scaling 10¼ lbs. was sent him. Mr. Slater remarks: 'Such specimens have been phenomenally numerous in our (Helmsley) district this year, mostly in "fog" fields.' One is recorded in a recent issue of 'Nature,' 57 in. horizontal circumference, weight 14 lbs. 10 ozs., from Wellington, Somersetshire. See also 'The Naturalist,' August 1900, for record of large Horse Mushroom.

On the Monday evening Mr. Massee gave a most interesting address on 'Mycological Research in the United States,' an abstract of which is appended.

The weather was all that could be desired for collecting purposes. The rule was, home at three o'clock, so as to allow time to work out the spoils. Good ground, central billet, fit weather, and close work, all combined to bring about satisfactory results. About 430 specimens were totted up, including many new to the county, and the following four:—

Crepidotus putrigenus Berk. & Curt., new to Europe.

Colletotrichum lycopersici Chester, new to Europe.

Dasyscypha Richonii Mass., new to Britain.

Œdocephalum glomerulosum Sacc., new to Britain.

Mr. Clarke's stereoscopic views of fungi, along with water-colour drawings of micro-species by Messrs. Massee and Crossland, were present for inspection.

Lord Normanby was very considerate in allowing the mycologists the run of his charming and extensive woods. Evidently he also took an interest in the object, ordering inquiries to be made respecting fungi that he himself had specially observed.

The constitution of the committee remains the same as last year, Mr. Massee being recommended for re-election as chairman. Conisborough, South Yorkshire, is recommended as next year's meeting place.

1900 November 1.

In the following list the Hymenomycetes are arranged according to Fries' system, but the names are as in Massee's 'British Fungus Flora.' All are from Mulgrave Woods or adjoining fields :—

BASIDIOMYCETES.

HYMENOMYCETES.

AGARICACEÆ.

Amanita mappa Fr.
Amanita pantherina Fr.
Amanita rubescens Fr.
Amanitopsis vaginata Roze.
Lepiota procera Scop.
Lepiota gracilenta Krombh.
Lepiota Friesii Lasch.
Lepiota cristata A.&S.
Lepiota granulata Batsch.
Armillaria mellea Fl.Dan.
Tricholoma flavo-brunneum Fr.
Tricholoma stans Fr.
Tricholoma rutilans Schæff.
Tricholoma murinaceum Bull.
Tricholoma terreum Schæff.
Tricholoma virgatum Fr.
Tricholoma inamœnum Fr.
Tricholoma carneum Bull.
Tricholoma personatum Fr.
Tricholoma grammopodium Bull.
Tricholoma melaleucum Pers.
Clitocybe odorus Bull.
Clitocybe trogii Fr.
Clitocybe infundibuliformis Schæff.
Clitocybe brumalis Fr.
Clitocybe metachroa Fr.
Clitocybe fragrans Sow.
Laccaria laccata Scop. and
var. amethystina Bolt.
Collybia radicata Bull.
Collybia platyphylla Fr.
Collybia maculata A.&S.
Collybia butyracea Bull.
Collybia confluens Pers.
Collybia acervata Bull.
Collybia ocellata Fr.
Collybia rancida Fr.
Mycena pura Pers.
Mycena lactea Pers.
Mycena rugosa Fr.
Mycena galericulata Scop.
Mycena polygramma Bull.
Mycena dissiliens Fr.
Mycena atrocyanea Batsch.
Mycena alcalina Fr.
Mycena leptocephala Pers.
Mycena discopoda Lèv.
Mycena ammoniaca Fr.
Mycena stannea Fr.
Mycena filopes Bull.
Mycena debilis Fr.
Mycena acicula Schæff.
Mycena hæmatopoda Fr.
Mycena sanguinolenta Fr.
Mycena galopoda Fr.
Mycena epipterygia Fr.
Omphalia stellata Fr.
Omphalia campanella Batsch.
Omphalia fibula Bull.
Omphalia integrella Pers.
Pleurotus lignatilis Fr.
Pleurotus acerinus Fr.
Pleurotus mitis Pers.
Pluteus cervinus Schæff.
Pluteus ephebius Fr.
Pluteus spilopus B.&Br.
Pluteus chrysophæus Schæff.
Pluteus phlebophorus Ditt.
Entoloma sinuatum Fr.
Entoloma jubatum Fr.
Entoloma sericellum Fr.
Entoloma costatum Fr.
Entoloma sericeum Bull.
Entoloma speculum Fr.
Clitopilus orcella Bull.
Clitopilus cretatus B.&Br.
Leptonia lampropoda Fr.
Nolanea pascua Pers.
Eccilia carneogrisea B.&Br.
Eccilia atropuncta Pers.
Claudopus variabilis Pers.
Pholiota erebia Fr.
Pholiota togularis Bull.
Pholiota radicosa Bull.
Pholiota spectabilis Fr.
Pholiota mutabilis Schæff.
Pholiota marginata Batsch.
Inocybe cincinnata Fr.
Inocybe pyriodora Pers.
Inocybe flocculosa Berk.

Inocybe mutica Fr.
Inocybe rimosa Bull.
Inocybe eutheles B.&Br.
Inocybe destricta Fr.
Inocybe perbrevis Weinm.
Inocybe trinii Weinm.
Inocybe sambucina Fr.
Inocybe geophylla Sow.
Inocybe vatricosa Fr.
Hebeloma fastibile Fr.
Hebeloma sinapizans Fr.
Hebeloma longicaudum Pers.
Hebeloma petiginosum Fr.
Flammula mixta Fr.
Naucoria sobria Fr.
Naucoria conspersa Fr.
Galera tener Schæff.
Galera spartea Fr.
Galera rubiginosa Pers.
Galera hypnorum Batsch.
Tubaria furfuracea Pers.
Crepidotus mollis Schæff.
*Crepidotus putrigenus Berk.&Curt.
Agaricus arvensis Schæff.
Agaricus campestris Linn. var. hortensis.
Stropharia æruginosa Curt.
Stropharia albocyanea Desm.
Stropharia stercoraria Fr.
Stropharia semiglobata Batsch.
Hypholoma sublateritium Schæff.
Hypholoma fasciculare Huds.
Hypholoma velutinum Pers.
Hypholoma pyrotrichum Holm.
Psilocybe sarcocephala Fr.
Psilocybe semilanceata Fr.
Psilocybe hygrophila Fr.
Psilocybe fœnisecii Pers.
Psathyra corrugis Pers.
Psathyra semivestita B.&Br.
Anellaria separata Karst.
Anellaria fimiputris (Bull.).
Paneolus retirugis Fr.
Paneolus campanulatus L.
Paneolus papilionaceus Bull.
Psathyrella gracilis Fr.
Psathyrella hiascens Fr.
Psathyrella pronus Fr.
Psathyrella disseminatus Pers.
Psathyrella atomata Fr.
Coprinus comatus Fr.
Coprinus ovatus Schæff.
Coprinus atramentarius Fr.
Coprinus fuscescens Fr.
Coprinus micaceus Bull.
Coprinus lagopus Fr.
Coprinus radiatus Bolt.
Coprinus ephemerus Fr.
Coprinus sociatus Fr.
Coprinus plicatilis Curt.
Coprinus hemerobius Fr.
Cortinarius (Phleg.) largus Fr.
Cortinarius (Myxa) elatior Fr.
Cortinarius (Inol.) pholideus Fr.
Cortinarius (Derm.) ochroleucus Schæff.
Cortinarius (Derm.) caninus Fr.
Cortinarius (Derm.) sanguineus Wulf.
Cortinarius (Derm.) cinnamomeus L.
Cortinarius (Tela.) torvus Fr.
Cortinarius (Tela.) impennis Fr.
Cortinarius (Tela.) hinnuleus Fr.
Cortinarius (Tela.) paleaceus Fr.
Cortinarius (Hygro.) acutus Pers.
Paxillus involutus Batsch.
Hygrophorus chrysodon Batsch.
Hygrophorus cossus Sow.
Hygrophorus pratensis Pers.
Hygrophorus virgineus Wulf.
Hygrophorus niveus Scop.
Hygrophorus Clarkii B.&Br.
Hygrophorus ovinus Bull.
Hygrophorus lœtus Fr.
Hygrophorus ceraceus Wulf.
Hygrophorus coccineus Schæff.
Hygrophorus miniatus Fr.
Hygrophorus micaceus B.&Br.
Hygrophorus puniceus Fr.
Hygrophorus obrusseus Fr.
Hygrophorus conicus Scop.
Hygrophorus calyptriformis Berk.
Hygrophorus chlorophanus Fr.
Hygrophorus psittacinus Schæff.
Hygrophorus unguinosus Fr.
Lactarius blennius Fr.
Lactarius pyrogalus Bull.
Lactarius piperatus Scop.
Lactarius quietus Fr.
Lactarius fuliginosus Fr.
Lactarius picinus Fr.
Lactarius mitissimus Fr.

Lactarius subdulcis Bull.
Lactarius camphoratus Fr.
Lactarius minimus Smith.
Russula nigricans Bull.
Russula adusta Pers.
Russula delica Fr.
Russula furcata Pers.
Russula depallens Fr.
Russula virescens Schæff.
Russula xerampelina Schæff.
Russula cyanoxantha Schæff.
Russula consobrina Fr.
var. sororia Larb.
Russula fœtens Pers.
Russula fellea Fr.
Russula emetica Fr.
Russula ochroleuca Pers.
Russula granulosa Cooke.
Russula fragilis Pers.
Russula citrina Gillet.
Cantharellus infundibuliformis Fr.
Nyctalis parasitica Bull.
Marasmius oreades Bolt.
Marasmius rotula Scop.
Marasmius institutius Fr.
Marasmius Hudsoni Pers.
Lenzites flaccida Bull.

POLYPORACEÆ.

Boletus luteus L.
Boletus chrysenteron Fr.
Boletus subtomentosus L.
Boletus Rostkovii Fr.
Boletus granulatus L.
Boletus edulis Bull.
Boletus felleus Bull.
Polyporus squamosus Fr.
Polyporus varius Fr.
Polyporus elegans Fr.
Polyporus sulphureus Fr.
Polyporus salignus Fr.
Polyporus dryadeus Fr.
Polyporus hispidus Fr.
Polyporus chioneus Fr.
Polyporus adiposus B.&Br.
Fomes fomentarius Fr.
Fomes annosus Fr.
Fomes ferruginosus (Fr.) Mass.
Polystictus versicolor Fr.
Polystictus hirsutus Fr.
Poria vaporaria Fr.
Poria vulgaris Fr.
Poria Hibernica B.&Br.
Poria sanguinolenta A.&S.
Dædalea quercina Pers.
Dædalea latissima Fr.
Merulius lachrymans Fr.

HYDNACEÆ.

Hydnum repandum L.
Hydnum alutaceum Fr.
Hydnum viride Fr.
Hydnum niveum Pers.
Caldesiella ferruginosa Sacc.
Irpex obliquus Fr.
Radulum quercinum Fr.
Grandinia granulosa Fr.
Odontia fimbriata Pers.

THELEPHORACEÆ.

Craterellus cornucopioides Pers.
Solenia maxima Mass.
Cyphella albo-violascens Karst.
Cyphella villosa Karst.
Stereum hirsutum Fr.
Stereum sanguinolentum Fr.
Stereum rugosum Fr.
Stereum spadiceum Fr.
Stereum frustulosum Fr.
Corticium sebaceum (Berk.) Mass.
Corticium Carlylei Mass.
Corticium comedens Fr.
Hymenochæte rubiginosa Lév.
Hymenochæte leonina
Berk.&Curt.
Hymenochæte tabacina Lév.
Peniophora quercina Cooke.
Peniophora ochracea (Fr.) Mass.
Peniophora cinerea (Berk.) Cooke.
Soppittiella fastidiosa (Berk.) Mass.
Coniophora arida (Stev.) Karst.
Coniophora umbrina (Stev.) Mass.

CLAVARIACEÆ.

Clavaria muscoides L.
Clavaria coralloides L.
Clavaria cinerea Bull.
Clavaria cristata Holmsk.
Clavaria rugosa Bull.
Clavaria aurea Schæff.
Clavaria condensata Fr.
Clavaria fusiformis Sow.
Clavaria inæqualis Fl. Dan.
Clavaria argillacea Fr.
Clavaria vermicularis Scop.
Clavaria fumosa Pers.
Typhula muscicola Fr.

Naturalist,

TREMELLINACEÆ.

Exidia albida (Cke.) Brefeld.
Tremella frondosa Fr.
Tremella lutescens Pers.
Dacryomyces deliquescens Duby.
Dacryomyces stillatus Nees.
Calocera viscosa Fr.
Calocera cornea Fr.

GASTROMYCETES.

Scleroderma verrucosum Pers.
Lycoperdon saccatum Vahl.
Lycoperdon gemmatum Batsch.
Lycoperdon pyriforme Schæff.
Lycoperdon bovista L.
Lycoperdon plumbeum Pers.
Lycoperdon nigrescens Vitt.
Geaster Michelianus W.G.Sm.
Ithyphallus impudicus Fisch.
Mutinus caninus Fr.

HEMI-BASIDIOMYCETES.

Hirneola auricula-judæ Berk.

UREDINACEÆ.

Puccinia violæ (Schum.).
Puccinia primulæ (DC.).
Puccinia poarum Niel.
(All stages.)
Puccinia dioicæ Magnus.
Puccinia suaveolens (Pers.)
Puccinia oblongata Link.
Puccinia malvacearum Mont.
Phragmidium mucronatum Fr.
Melampsora circææ (Schum.).
Uredo agrimoniæ DC.

ASCOMYCETES.

DISCOMYCETACEÆ.

Helvella lacunosa Afz.
Helvella elastica Bull.
Leotia lubrica Pers.
Leotia acicularis Pers.
Otidea cochleata (Bull.) Fckl.
Galactinia succosa Berk.
Humaria oocardi (Kalch.) Sacc.
Humaria granulata (Bull.) Sacc.
*Dasyscypha Richonii (Sacc.) Mass.
Dasyscypha virginea
(Batsch.) Fckl.
Dasyscypha nivea (Hedw.) Mass.
Dasyscypha aspidicola
(B.& Br.) Sacc.
Dasyscypha hyalina (Pers.) Mass.
Dasyscypha melaxantha
(Fr.) Mass.
Lachnea scutellata (L.) Gill.
Lachnea dalmeniensis (Cke.) Phil.
Lachnea albo-spadicea
(Grev.) Phil.
Diplocarpa Curreyana Mass.
Erinella juncicola Sacc.
Sphærospora trechispora
(B.& Br.) Sacc.
Sphærospora asperior (Nyl.) Sacc.
Chlorosplenium æruginosum
(Œd.) Tul.
Cyathicula coronata
(Bull.) DeNot.
Helotium citrinum (Hedw.) Fr.
Helotium pallescens Fr.
Helotium flavum (Klotzch.) Phil.
Helotium cyathoideum
(Bull.) Karst.
Helotium scutulum (Pers.) Karst.
Helotium punctiforme (Grev.) Phil.
Helotium fagineum (Pers.) Fr.
Helotium conigenum (Pers.) Fr.
Belonidium pruinosum
(Jerd.) Mass.
Mollisia cinerea (Batsch.).
Mollisia atrocinerea (Cke.) Phil.
Pseudopeziza trifolii Fckl.
Pseudopeziza benesueda
(Tul.) Mass.
Ascobolus vinosus Berk.
Ascobolus furfuraceus Pers.
Ascobolus viridis Currey.
Coryne sarcoides (Jacq.) Tul.
Orbilia leucostigma Fr., also
var. xanthostigma Fr.
Orbilia inflatula Karst.
Bulgaria polymorpha
(Œder) Wetts.
Bulgariella pulla (Fr.) Karst.
Rhytisma acerinum (Pers.) Fr.
Rhytisma punctatum (Pers.) Fr.
Trochila craterium Fr.
Trochila laurocerasi Fr.
Trochila ilicis (Fr.) Crouan.

PYRENOMYCETACEÆ.

PERISPORACEÆ.

Sphærotheca pannosa (Wallr.).
Erysiphe Martii Link.
Erysiphe Montagnei Lév.

HYPOCREACEÆ.

Cordyceps militaris (L.) Link.
(Also its conidial form.)
Hypomyces rosellus (A.&S.) Tul.
Hypocrea rufa (Pers.) Fr.
Nectria cinnabarina (Tode) Fr.
Nectria episphæria (Tode) Fr.
Nectria aurea Grev.

SPHÆRIACEÆ.

Lasiosphæria ovina
(Pers.) Ces.&DeNot.
Eutypa lata (Pers.) Tul.
Xylaria hypoxylon (L.) Grev.
Xylaria carpophila (Pers.) Fr.
Xylaria corniformis Fr.
Hypoxylon fuscum (Pers.) Fr.
Dothidea pteridis Fr.
Diatrype disciformis Fr.
Byssosphæria aquila Fr.
Sphæria pulvis-pyrius Pers.
Sphæria complanata Tode.
Sphæria acuta Moug.
Sphærella rumicis Desm.

PHYCOMYCETES.

Pilobolus crystallinus Tode.
Mucor mucedo L. var. caninus.
Syzygites megalocarpus Ehrh.

HYPHOMYCETES.

MUCEDINEÆ.

*Œdocephalum glomerulosum
Sacc.
Botryosporium pulchrum Corda.
Ovularia obliqua Oudem.
Sepedonium chrysospermum Fr.

DEMATIEÆ.

Periconia podospora Corda.
Haplographium bicolor Grove.
Cladosporium epiphyllum Mart.
Helicosporium Mülleri Sacc.

STILBEÆ.

Stilbum tomentosum Schr.
Stilbum fimetarium B.&Br.
Isaria sulphurea Friedl.

TUBERCULARIEÆ.

Ægerita candida Pers.
Volutella ciliata Fr.

SPHÆROPSIDEÆ.

Phoma nebulosum Berk.
Phoma samarorum Desm.
Diplodia ilicis Curr.
Vermicularia atramentaria B.&Br.

MYXOGASTRES.

Ceratiomyxa mucida Schrœter.
Tubulina cylindrica (Bull.)
DC. Fl.F.
Cribraria argillacea Pers.
Stemonitis fusca Roth.
Stemonitis ferruginea Ehrh.
Perichæna corticalis (Batsch.) Fr.
Lycogala epidendrum Fr.
Arcyria punicea Pers.
Arcyria incarnata Pers.
Arcyria nutans (Bull.) Grev.
Trichia varia Rost.
Trichia fallax Pers.
Trichia affinis DeBary.
Didymium serpula Fr.
Craterium confusum Mass.
Craterium aureum (Schum.) Rost.
Tilmadoche nutans (Pers.) Rost.
Fuligo varians Somm.

MYCOLOGICAL RESEARCH IN THE UNITED STATES (ABSTRACT).

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British mycologists have been accused by one of themselves as being behind the times in matters mycological, owing to 'insular prejudices.' Acting on this assumed ignorance some authors have gone so far as to favour us with mycological works culled

largely from German sources, without admitting the fact; such works passing with the uninitiated as evidence of much original research.

With the object of atoning for the past, and also of trying to do better in the future, it will be well to devote the limited time at our disposal to a brief review of the state of mycological progress in the United States.

One of the earliest contributions was produced by Schweinitz, who, along with Albertini, did some good work in Europe about the beginning of the present century. Schweinitz's diagnoses are brief, and, in the absence of authentic specimens, useless. At a later date numerous American species were described by Curtis and Berkeley in 'Grevillea,' the material, accompanied by copious notes, being furnished by the first named. Fortunately, the great bulk of types of this collection are preserved at Kew, duplicates of which are in American collections. The descriptions are just a trifle better than those by Schweinitz, nevertheless inadequate.

Ravenel and Ellis are names well known to mycologists throughout the world, not only as collectors of fungi, but also as keen and accurate observers. Ravenel's extensive collections, made in the Southern States, were determined by Dr. M. C. Cooke, at Kew. Ellis, in addition to numerous contributions relating to fungi, published at intervals extending over many years, has produced an excellent volume, abounding with illustrations, dealing with all the known American Pyrenomycetes.

Professor C. Peck, of the State Hall, Albany, has devoted a lifetime to the description and delineation of fungi, and has paid special attention to edible species.

Parasitic fungi, especially those of economic importance, have received special attention at the hands of many of the mycologists attached to the various agricultural research stations.

The modern method of teaching mycology was introduced to the United States by Dr. W. G. Farlow, Professor of Cryptogamic Botany at Harvard University, who studied under the late Professor DeBary, and amongst the many American mycologists who have benefited either directly or indirectly by Dr. Farlow's teaching, his student Dr. Thaxter is undoubtedly by far the best systematic mycologist at present living in the United States. In too many instances the mycologist of a few years' standing considers it his duty to inflict on his fellow creatures a list of the fungi of his district, or he may go so far as to write a text-book on mycology in general. Such rash acts, unless the author is

1900 November 1.

exceptionally pachydermatous, are often regretted in after years. Dr. Thaxter wisely avoided all such pitfalls, and, settling down as a specialist, has, after some years of study, produced one of the most important, as also one of the most beautifully illustrated of monographs ever written on a mycological subject. This work, entitled 'Contributions towards a Monograph of the Laboulbeniaceæ,' forms Vol. XII., No. III., of the 'Memoirs of the American Academy of Arts and Sciences,' 1896.

The monograph deals with the morphology, life-history, and systematic arrangement of a family of minute fungi, the majority of which are external parasites on insects, species belonging to the coleoptera, especially aquatic forms, being the most favoured hosts, although members of other groups of insects are also attacked, the common house-fly having furnished some very interesting forms. One species occurs on the larva of a white ant, and one on an Acarid.

The vegetable nature of these minute organisms was first recognised by Robin, a Frenchman, in a classical work entitled 'Histoire Naturelle des Végétaux Parasites,' but up to the period of Thaxter's investigations only about half-a-dozen species were known, and these were very imperfectly understood, and their great importance, from a biological and taxonomic standpoint, entirely unsuspected.

The species are all minute, in fact coming under the category of microscopic fungi, one millimetre in length being above the average. The general appearance of these fungi on the host is described as follows by Thaxter:—'When examined in situ on the host insect they appear in general like minute, usually dark-coloured or yellowish bristles or bushy hairs, projecting from its chitinous integument, either singly or in pairs, more commonly scattered, but often densely crowded over certain areas, on which they form a furry coating.

Unlike other fungus parasites on insects, as the species of *Cordyceps*, etc., the species of Laboulbeniaceæ do not appear to prove injurious to the host, at all events not to the extent of causing death, or even a serious epidemic.

The forms presented by these minute fungi are very varied and often very beautiful, but the chief interest in the group centres on the sexual mode of reproduction, which in all essential points corresponds with that of the Florideæ or red seaweeds. The female organ consists of a trichogyne or slender projecting filament to which the passive or motionless antheridia adhere, and thus effect fertilisation, and a carpogenic cell, the

portion which is fertilised, after which it produces asci containing spores as in other ascomycetous fungi. Simultaneously with the fertilisation of the carpogenic cell a vegetative growth takes place forming a perithecium or protective covering enclosing the asci.

The antheridia are produced in two different ways; in the majority of species they are endogenous, being produced in flask-shaped cavities, whereas in some few species they are produced laterally on slender hair-like structures, or exogenous.

Some species are monœcious, others dicœcious. The spores are colourless, spindle-shaped, 1-septate, and in the dicœcious species the spores are enclosed in pairs in a mucilaginous sheath, one of the pair of spores producing a male plant, the other a female plant, and as the spore couples adhere together, a male and female plant respectively are produced side by side on the host.

In addition to the agreement between the Laboulbeniaceæ and the Florideæ in the structure of their reproductive organs, the two groups also agree in possessing very clearly defined 'continuity of protoplasm, hence suggesting a possible closer affinity between the fungi and the algæ than was previously suspected. For the discussion on this point in detail, along with other matters relating to affinities, the original monograph must be consulted.

Every point of structure indicates that the Laboulbeniaceæ are genuine ascomycetous fungi, and the presence of undoubted sexual reproduction disposes once for all of Brefeld's contention that sexual reproduction has disappeared from the Ascomycetes.

The number of species described in the monograph is 158, distributed among 30 genera, and the same author has almost as many more species, some already described, the whole to be incorporated in a second monograph which the author informed me would be ready in two years hence.

Dr. Thaxter has twice visited Europe for the purpose of examining the large collections of insects in national museums and elsewhere, as the fungi, being of a somewhat firm structure, retain all their essential features after desiccation. Research of this kind has shown that these minute fungi occur in every part of the world.

I may perhaps be allowed to state the fact that not a single species of the Laboulbeniaceæ is known to exist in Britain, yet undoubtedly we have many with us.

Another very interesting piece of work by Dr. Thaxter was the discovery that a section of the Bacteria or Schizomycetes

differed in habit from the remainder in the formation of erect masses of fairly constant form for each species, but presenting great variety of form in the different genera. Some of these structures are vaguely branched or coralloid, others are globose heads, or clusters of heads like a bunch of grapes, borne on a slender stem. These bodies originate as follows: a colony of rod-like Bacteria is formed by repeated fission of one or more primary individuals; the individuals forming the colony remain distinct from each other, possess a power of slow locomotion, and secrete a gelatinous substance which encloses the entire mass. When the vegetative method of reproduction by fission is completed the rods concentrate at various points of the colony; this concentration produces projections rising above the common level of the mass, and as the bacteria continue to swarm into the projecting portions, these rise higher and higher, assuming the configuration peculiar to the species. The elongating body is always surrounded by the glairy mass, which finally hardens and forms the supporting stem, the whole of the bacteria having passed into the uppermost portion, round which the mucilage hardens, and forms a compact mass of encysted bacteria. These cysts finally break away from the common support and are dispersed by wind and other agents, remaining in an encysted condition until conditions are favourable for the formation of a new colony, when the process is repeated.

Most of the species are orange in colour, and are not uncommon on bark, lichens, etc. The name given to this peculiar group of organisms by Thaxter is Myxobacteriaceæ. Some of the species have been described by mycologists as moulds, which they resemble in size and general appearance. The peculiar swarming habit of the Myxobacteriaceæ agrees with what takes place in the Myxogastres, where the living portion of the plasmodium swarms up a skeleton formed by a mucilaginous substance mixed with the plasmodium.

Lack of power of observation and other shortcomings may prevent the bulk of us from producing work of equal merit to that done by Dr. Thaxter; nevertheless, whatever the calibre of mind may be, I think that the above brief and imperfect sketch goes far to prove that specialisation will afford more personal pleasure, and prove of greater value to the world at large than can be attained by attempting the impossible, in other words, endeavouring to deal with the whole of the fungi, of which we have 5,000 species in Great Britain.

NOTES—COLEOPTERA.

***Pissodes pini* near Carlisle.**—I have this year taken, for the first time, this interesting Weevil in Cumberland. Altogether I secured fourteen specimens, all of which were found sitting on the under sides of fir logs left lying on the ground in the Orton Woods, near Carlisle. The way to find them is to diligently turn over all fir logs, as I should think I only got one beetle for about every fifty logs turned. My first specimen was found on the 17th May, when I got one, and my last on the 7th July, when I secured seven.—Jas. Murray, 11, Close Street, Carlisle, 20th October 1900.

***Carabus glabratus* and other Beetles in Upper Teesdale.**—On a beautiful day last week I traversed some of the high ground in Upper Teesdale on the Yorkshire side of the river. July is not a good month for many of the moorland beetles, but I took two specimens of the mountain insect *Carabus glabratus* on the slope of Mickle Fell. It was far too late for water beetles, but after trying two or three pools a single *Hydroporus morio* (*atriceps*) appeared in the net. Of the hill-frequenting *Aphodii* in the dung of sheep, *A. fœtidus* and *A. putridus* were both met with on the fell, besides the common *A. lapponum*—an insect found on other Yorkshire moors.—M. Lawson Thompson, 35, Leven Street, Saltburn, 16th July 1900.

NOTES—CONCHOLOGY.

***Helix hortensis* and *H. nemoralis* at North Ormesby, Lincs.**—As *Helix hortensis* is locally somewhat scarce, it may be of interest to note I found a small colony in a chalk-pit at North Ormesby, principally v. *lutea* 00000. From the same place I got *H. nemoralis* v. *albolabiata* + *hyalozonata* 00300, and v. *libellula* 1034 × 5.—C. S. Carter, 172, Eastgate, Louth, Lincs., 17th September 1900.

Molluscan Notes, Louth District.—On the 11th October I found *Helix aculeata* under some timber on the sand-hills at Trusthorpe.

Amongst my finds on Saturday, the 13th October were *Helix nemoralis* v. *hyalozonata* $00_{3}45$, v. *libellula-roseolabiata* 12345, v. *libellula-albolabiata* (12)3(45). *Helix hortensis* v. *albina* 12345, 10345, $1_{2}345$, 00000, var. *lutea* 00000. *Helix arbustorum* with vars. *conoidea, flavescens, flavescens-conoidea. Helix hispida, H. rufescens, H. ericetorum* and v. *alba, H. caperata* and var. *ornata, H. pulchella, H. rotundata, Hyalinia cellaria, H. alliaria*, one specimen of *Hyalinia glabra, Clausilia rugosa, Cochlicopa lubrica*, and *Carychium minimum*—all taken from a chalk-pit at North Ormsby, near Louth.—C. S. Carter, 172, Eastgate, Louth, 17th October 1900.

NOTES AND NEWS.

It is worth notice that the 'Fishery Scholarships' under the Lancashire Sea Fisheries Joint Committee were, on examination of the applicants, due in May last; the course in Liverpool commencing in October. There are also studentships open to Lancashire fishermen. A move in the right direction, for some of these men surely will not be content with this fortnight's teaching, and will think and work for themselves.

We are glad to learn that the Society for the Protection of Birds is offering two prizes, of £10 and £5 respectively, for the best papers on the protection of British birds. The mode of dealing with the subject is left entirely to competitors, but among the points suggested for treatment are the utilisation and enforcement of the present Acts and County Council Orders; the modification or improvement of the law; educational methods; and the best means of influencing land-owners and game-keepers, agriculturists and gardeners, collectors, bird-catchers, and bird-nesters. Essays are to be sent in by 30th November. Particulars may be obtained from the Hon. Secretary, Mrs. F. E. Lemon, at the Society's offices, 3, Hanover Square, London, W.

NOTE—ORNITHOLOGY.

***Puffinus yelkouanus* at Scarborough.**—An immature female specimen of the Levantine Shearwater (*Puffinus yelkouanus*) was shot at Scarborough on 13th September. It was brought, along with other birds which had been shot out of a boat in the bay, to Mr. W. J. Clarke, who, recognising that it differed from our Manx Shearwater, forwarded it to Mr. Howard Saunders, who confirmed Mr. Clarke's identification.

The bird, which has come into my possession, is, I think, the fifth recorded for Britain, and the second for Yorkshire—the one previously obtained in the county being, I believe, now in the South Kensington Museum.—R. FORTUNE, 16, Mount Parade, Harrogate, 13th October 1900.

BOOK NOTICES.

'Tommy Smith's Animals,' by **Edmund Selous** (small 8vo. cloth, 207 pages, 2s. 6d., Methuen & Co., 1899), is a child's book in which various animals are represented as giving Tommy Smith practical lessons in common humanity.

From the firm of Georges Carré et C. Naud, Éditeurs, Paris, we have received a small book by M. **Paul Busquet,** on **'Les Êtres Vivants | Organisation—Évolution,'** published in 1899, as an instalment of the Bibliothèque de la Revue Générale des Sciences. This little work deals with biological problems in opposition to the usually received hypotheses of biologists and evolutionists, and is freely illustrated in the text.

Agricultural Botany | Theoretical and Practical | by | John Percival, M.A.(Cantab.), F.L.S. | Professor of Botany at the South Eastern | Agricultural College, Wye. | London. Duckworth & Co. 1900. 8vo. Price 7s. 6d. nett.

If one has a fault to find with 'Agricultural Botany,' it is perhaps on account of its south country origin. Are its opinions those of, say, the institution at Aspatria in Cumberland? Otherwise it is a capital book, some of the sections, e.g., 'Physiology of Plants' and 'Weeds,' appealing to others than the farmer, and to him no doubt the section on 'Farm Seeds' will be useful if he will take the trouble to be guided by it. Good, too, is Chapter 23, on 'Sports and Variation.' In the 'Weed' section we read of *Cuscuta, Orobanche minor,* and Mistletoe as weeds to be destroyed. No doubt, but this is one of the cases which do not apply to the North of England and very partially, at least, in the Midlands. The advice about the Charlock pest is the same as in the Board of Agriculture Leaflet 63. Prof. Percival says its prevalence is due to over-cropping. In Lancashire and Yorkshire it is usually supposed to be neglect, or growing two 'white' crops on the same ground in succession, i.e., bad farming. There is a section on the Solanaceæ, but no mention is made of the equally poisonous Yew. The illustrations are, on the whole, enough. If this book is any guide to the instruction given at the South Eastern College, the students certainly have plenty to do. We notice that a knowledge of microscopical manipulation is taken for granted, but not all readers of the book will possess an instrument, or know how to stain.—S. L. P.

A Glossary | of | Botanic Terms | with their derivation and accent | by | **Benjamin Daydon Jackson.** | London. Duckworth & Co. 1900. 6s. nett.

Mr. Jackson's 'Glossary' is a book to be treated with respect by a reviewer whose knowledge is not sufficient to enable him to think of a word which he cannot find in the 'Glossary.' Even H. C. Watson's 'Incognit' finds a place, and under 'Ringworm' we are told it is due to *Trichophyton tonsurans* Malmsten. It is one of those books which are not books from the collector's standpoint, but till it is on the botanist's shelf his collection has a vacant place which none other can fill.—S. L. P.

Naturalist,

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FLORA OF WORKSOP DISTRICT.

Rev. HILDERIC FRIEND,
Chichester, Sussex.

I have just come across a mislaid note-book of 1886, in which are sundry entries relating to the plants of Worksop and the district which I have not published. Though they contain few new records they will be of value perhaps as confirming and extending our knowledge of localities in that part of Notts and South-West Yorkshire. Among Casuals I find that the Radish and Evening Primrose occurred among debris on the Chesterfield road; Monkshood and Feverfew at Kiveton; *Datura* and Fennel in Worksop; and Horseradish frequently near houses. I take the Natives in their order.

Ranunculus Flammula. Notts. Lindrick, Budby, Haggonfields, Belph.

Ranunculus hederaceus. Notts. Thoresby Lake; ditches and pools at Wellow.

Thalictrum flavum. Notts. Haggonfields.

Helleborus viridis. Notts. Wallingwells.

Aquilegia vulgaris. York S.W. Anston Stones, Roche Abbey.

Aconitum Napellus. York S.W. Kiveton, probably an escape.

Nuphar lutea. Notts. Clumber Lake; Canal near Sewage Works, Worksop.

Thlaspi arvense. York S.W. Gateford, Anston, rather rare.

Teesdalia nudicaulis. Notts. About three miles out of Worksop on the Ollerton Road.

Viola palustris. Notts. Margins of Clumber Lake.

Viola tricolor. Notts. Road to Carlton.

Viola arvensis. Notts. Near Manor Woods; sandy fields.

Githago segetum. Notts. Carlton Road; very abundant at Boughton, 1885.

Hypericum hirsutum. Notts. A special form near Shireoaks

Malva moschata. Notts. Borders of fields near Haggonfields; grass drives, Worksop Manor; Shireoaks.

Geranium pratense. Notts. Sturton, 12th August 1885.

Rubus Idæus. Notts. Entrance to Clumber; Edwinstowe.

Geum intermedium. York S.W. Anston Crags.

Saxifraga granulata. Notts. Eakring.

Chrysosplenium oppositifolium. Notts. Budby. York S.W. Anston.

Parnassia palustris. Notts. Shireoaks; Haggonfields.

Hippuris vulgaris. Notts. Norton Cuckney.

Inula Conyza. York S.W. Anston Crags.

Lactuca muralis. Notts. Welbeck Lake End.

Tragopogon minus. Notts. Near Norton Cuckney.

Chlora perfoliata. Notts. Shireoaks, Haggonfields, Walesby.

Gentiana amarella. Notts. Shireoaks, Lindrick Common, Walesby; plentiful 1885.

Atropa Belladonna. Notts. Quarries at Shireoaks.

Hyoscyamus niger. Notts. Lady Lea Quarry, 1885.

Linaria Cymbalaria. York S.W. Harthill.

Lathræa squamaria. York S.W. Anston, Whitwell.

Samolus Valerandi. Notts. Shireoaks Quarries, abundant.

Lysimachia nummularia. Notts. Wellow Park; Beard's Mill, Worksop.

Lysimachia nemorum. Notts. Haggonfields.

Anagallis tenella. Notts. Lindrick, Haggonfields, Wellow.

Primula variabilis. York S.W. Anston. Notts. Shireoaks.

Daphne Laureola. York S.W. Anston Crags. Notts. Walesby.

Viscum album. Notts. Budby; Edwinstowe, abundant.

Humulus lupulus. York S.W. Kiveton. Notts. Ollerton.

Epipactis media. Notts. Welbeck, Carlton.

Ophrys apifera. Notts. Shireoaks and Lady Lea Quarries.

Ophrys muscifera. Notts. Shireoaks, abundant.

Orchis pyramidalis. York S.W. Roche Abbey.

Convallaria majalis. York S.W. Anston, Roche Abbey.

Gagea lutea. York S.W. Roche Abbey; rare, with a parasitic fungus then new to Britain.

Melica uniflora. York S.W. Anston, Whitwell.

Asplenium Trichomanes. York S.W. Anston Crags.

Cystopteris fragilis. York S.W. Anston Crags.

Ophioglossum vulgatum. York S.W. Anston. Notts. Haggonfields, Retford.

Lycopodium clavatum. Notts. Welbeck.

THE YORKSHIRE BOULDER COMMITTEE AND ITS THIRTEENTH YEAR'S WORK, 1898-9.

PERCY F. KENDALL, F.G.S., *Chairman*,
AND
J. H. HOWARTH, F.G.S., *Hon. Secretary*.

THE records during the year relate chiefly to the eastern side of the county, and we have again to gratefully acknowledge the continued interest shown by the members of the Boulder Committee of the Hull Geological Society.

The Chairman (Mr. Kendall) has been devoting a good deal of attention to North-East Yorkshire, and he and Mr. Muff have made some interesting records and observations.

The principal point to be noted in the reports is the extended area over which Scandinavian rocks are distributed inland from our east coast. The now well-known rhomb-porphyry has been found at Brantinghamthorpe by Mr. Crofts; at Brigham Hill, near North Frodingham, by Mr. Walton; at Yedmandale by Mr. Sheppard; and at Elloughton, near Brough, by Mr. Stather. There is, further, remarkable testimony to its presence at high levels. At several points exceeding 600 feet Ordnance datum it has been found by Messrs. Kendall and Muff on the Cleveland Hills, and by Mr. Stather at 810 feet Ordnance datum on West Rigg, in the Lockwood Hills, embedded in boulder clay. The note appended to Mr. Stather's records should be specially mentioned, showing that the pink flints common in the boulder clays of Holderness, and believed hitherto to be from Denmark, are unknown there.

On the Cleveland Hills some interesting facts are reported by Mr. Kendall, who says that he and Mr. Muff have found that at high altitudes there is a significant absence of the rocks which belong to the Teesdale dispersion, such as Shap granite, brockram, and whin sill, while all carboniferous rocks are exceedingly rare. On the other hand magnesian limestone of a type which appears to be restricted to the coast of Durham is very abundant in association with a profusion of porphyrites from the Cheviots, and occasional flints, Scandinavian rocks, and shell fragments.

On the west side of the county Messrs. Law, Burton, and others have continued a vigilant outlook in the Calder Valley and adjacent districts without, however, finding anything new.

1900 December 1.

BOULDER COMMITTEE OF THE HULL GEOLOGICAL SOCIETY,
26TH JULY 1899.

Reported by W. H. CROFTS.

BRANTINGHAMTHORPE.

Rhomb-porphyry, 3 in. × 2 in. × 2 in. West of the village, in the sandhill field.

Reported by F. F. WALTON, F.G.S.

CONEY GARTH, NEAR BRANDSBURTON.

Rhomb-porphyry, 6 in. in diameter.

BRIGHAM HILL, NEAR NORTH FRODINGHAM.

Rhomb-porphyry.

Reported by THOMAS SHEPPARD, F.G.S.

YEDMANDALE, NEAR WEST AYTON.

Rhomb-porphyry.

Reported by J. W. STATHER, F.G.S.

AYTON, EAST.

Garnetiferous schist.

BAINTON-ON-THE-WOLDS.

Basalt, granite, grit, brockram. From the boulder clay in the railway cutting east of the station.

BRANDSBURTON.

Rhomb-porphyry. Two pebbles, 3 in. and 4 in. in diameter. From the Barf Hill Quarry.

CAYTON BAY.

Shap granite, 2½ ft. × 2½ ft. × 2 ft. On the shore under Red Cliff, 300 or 400 yards north of the fault.

ELLOUGHTON, BROUGH.

Augite-syenite (Laurvikite), 12 in. × 15 in. × 18 in. From the Mill Hill gravel quarry, 100 feet above Ordnance datum.

FILEY.

Elæolite syenite. Two pebbles, 3 in. to 4 in. in diameter. From the boulder clay on the Carr Naze.

A mass of Upper Lias shale, 60 ft. long by 30 ft. broad, containing many fossils, including *Ammonites communis, Leda ovum, Belemnites* sp., etc., embedded in the boulder clay beach, south of the town. This boulder is situated 120 feet from the present cliff, about half a mile south of the Mile Haven ravine (Primrose Valley).

Rhomb-porphyry. Two specimens. From the brick-field on the Scarborough road, one mile north.

FLAMBOROUGH.

Rhomb-porphyry, 3 in. in diameter. Brick-field west of village.

GARTON-ON-THE-WOLDS.

Rhomb-porphyry. Two pebbles, each about 3 in. in diameter. From the Craike Hill Quarry.

GRISTHORP.

Rhomb-porphyry. Granite from Angermanland. Collected on the beach.

RUDSTONE.

Rhomb-porphyry, 3 in. in diameter. Found, along with numerous other boulders of the usual Holderness type, in small quarry opened in the Gypsey gravels, 1½ miles north of the village, on the road to North Burton.

SEAMER.

Basaltic rock, 3 ft. × 2 ft. × 2 ft., 200 feet above Ordnance datum. Seamer Moor Lane, immediately north of Waydale Lane end.

SPEETON.

Rhomb-porphyry; Silurian (?) fossilferous rock (?), 400 feet above Ordnance datum. From the moraine on which Speeton Mill stands.

THORNWICK BAY, FLAMBOROUGH.

Augite-syenite (Laurvikite), 4 in. × 3 in. × 3 in.

NOTE.—Following a suggestion in the Holderness memoir, we have become accustomed to regard Denmark as the source of the pink flints common in the boulder clays of Holderness. This proves to be erroneous. Mr. A. Jesson, of the Danish Geological Survey, recently informed the Secretary (Mr. Stather) that pink flints do not occur in either the cretaceous rocks or the drifts of Denmark, and are quite unknown there.

Reported by P. F. KENDALL, F.G.S., *and* H. B. MUFF.

GOATHLAND, NEAR SCARR WOOD. 480 O.D.

In red boulder clay: mica-schist, gneiss, Cleveland dyke, chalk-flint, Triassic sandstone, Jurassic sandstone, Cheviot porphyrite, and sparagmite (?) sandstone.

GOATHLAND, 200 yards east of the church. 520 O.D.

In boulder clay: porphyrite, flint.

Moss Dyke, Goathland. O.D.

Cheviot porphyrite, felsite, basalt, sparagmite (?) sandstone.

Randay Rigg, Goathland. 595 O.D.

One. Cleveland dyke.

Lealholm, quarry above middle of. 625 O.D.

Flint, porphyrite, andesite, granite, greenish grit (? sparagmite), quartzite, oolite with *Nerinæa,* basalt.

Lealholm to Stonegate, quarry at corner of road. 625 O.D.

Carboniferous chert, magnesian limestone, millstone grit, quartz-porphyry (? Elfdalen).

Stonegate, old railway cutting near bridge. 560 O.D.

Sparagmite (?) sandstone, porphyrite, basalt, granite, quartz-porphyry, andesite, andesitic ash and breccia, carboniferous chert (two specimens), carboniferous limestone (one specimen), millstone grit (four specimens), carboniferous basement conglomerate of Roman Fell type (one specimen), flint, jasper, poikilitic sandstone, old red sandstone (?), gneiss, hornblende-schist (two specimens), quartzite with pebbles of mica-schist, vein quartz. The matrix consisted largely of fragments of Upper Lias shale.

Another cutting near Wood Hill House contained a similar assemblage of stones, but magnesian limestone, with botryoidal structure, was very abundant, and a specimen of Middle Lias, with *Pecten equivalvis*, was found.

Commondale, near Skelderskew Farmhouse. 560 O.D.

Porphyrite, grey grit (? sparagmite), hornblende-schist, Shap granite.

Iburndale, 250 yards north of Throstle Nest. 80 O.D.

Shap granite.

Iburndale, path above New May Beck. 675 O.D.

Granite, porphyrite.

West Rigg, near Lockwood Reservoir. 810 O.D.

In boulder clay: flint, porphyrite, grit (? sparagmite), quartzite, basalt, coarse felspathic grit, andesite, carboniferous chert, schist, granite, one rhomb-porphyry found by Mr. J. W. Stather in situ in the boulder clay.

Danby, at junction of Ewe Crag Beck and Black Beck. 625 O.D.

Porphyrite, granite, rhomb-porphyry.

Peak Station. 650 O.D.

In gravel: gneiss, porphyrite, granite, basalt, ophitic dolerite, flint (some black), magnesian limestone (resembling that near Sunderland), vein quartz, quartzite, sandstone (? sparagmite), blue-green felspathic grit, Triassic sandstone, millstone grit (two specimens), quartz-porphyry (? Elfdalen), jasper, hornblende-schist, andesite. No carboniferous limestone or lias observed.

Peak, on moor near Green Dyke. 825 O.D.

Quartz-porphyry, porphyrite, granite, basalt, flint.

Danby, near Doubting Castle. 725 O.D.

Porphyrite, granite, flint, basalt.

Seavy Slack, Eastington High Moor. 700 O.D.

Gneiss, rhomb-porphyry.

Ainthorpe, near Danby, in field north of School-house. 500 O.D.

Porphyrite, Lake District volcanic ash.

Great Ayton, Rye Hill Gravel Pit. 425 O.D.

Porphyrite, very abundant and greatly preponderating over all other non-sedimentary rocks together. Millstone grit (rare), carboniferous limestone and chert (very rare), Lower and Middle Lias, Triassic sandstone, Jurassic grit, magnesian limestone, flints (both black and brown).

Scugdale, Sparrow Hall. 600 O.D.

Grit, carboniferous chert (one specimen), granite, green volcanic ash, porphyrite.

On Moor, near Harfa Bank Slack. 875 O.D.

One carboniferous chert with crinoid stems.

Swainby, Scarth Nick. 625 O.D.

Many large blocks of basalt and Lake District andesite, pebbles of porphyrite.

Stanghow Ridge, near Smithy. 675 O.D.

Shap granite.

Lockwood Hills. 850 O.D.

Near peat-holes gravel composed largely (at least one-third) of porphyrite.

Hutton, near Guisborough—Cod Hill Farm. 800 O.D.

Porphyrite.

BOLD VENTURE. 825 O.D.
Porphyrite and volcanic ash.

CARLTON BANK. On watershed, 925-950 O.D.
Pebbles of carboniferous grit, porphyrite, and volcanic ash.

WHITBY. On beach.
Elæolite syenite, exactly resembling that of Kvelle, near Larvik.

WHITBY. In upper boulder clay.
Coarse dolerite, resembling closely that of Crawford-John.

NOTES—PALÆONTOLOGY.

Mammoth's Tooth at Staithes.—With reference to Mr. H. B. Muff's note in the October 'Naturalist,' I was at Staithes a short time ago, and was shown a fairly complete specimen of a tooth of a Mammoth (*Elephas primigenius*). It was in the possession of a fossil collector who has a small shop on the left-hand side of the road from the station to the village, and who had found it on the beach, it having evidently dropped out of the boulder clay which caps the cliffs on parts of the neighbouring coast. This is worthy of note, as Staithes is some miles north of Robin Hood's Bay.—E. HAWKESWORTH, Hunslet, Leeds, 6th November 1900.

Kimeridge Clay Fossils: Market Rasen.—While paying a visit to Market Rasen on the 7th September I inspected the Brick and Tile Company's pits on the Willingham road, and collected the following fossils, which have been named at the British Museum by the kindness of Mr. R. Bullen Newton, F.G.S.:—

Ammonites biflex Sow.
Nuculana lineata Blake.
Astarte supercorallina D'Orb.
Ammonites triplicatus Sow.
Thracia depressa Sow.
Ammonites mutabilis Sow.
Corbula carinata Brev.

—MAX PEACOCK, Cadney, Brigg, 1st October 1900.

NOTES—LEPIDOPTERA.

Hummingbird Hawkmoth at Winnington, Northwich.—I noticed in my garden at the end of August, a very fine specimen of the Hummingbird Moth (*Macroglossa stellatarum*), and my wife and I watched it for over half-an-hour.—B. R. LUCAS, 3, Dyer Terrace, Winnington, Northwich, 2nd November 1900.

Church-Bell in Furness as Hibernaculum of *Vanessid* Butterflies.—Whilst recently investigating an ancient bell at Colton Church, Furness, North Lancashire (Lat. 54° 16′), I discovered inside the bell, at the haunch or shoulder, one specimen of *Vanessa io* and two of *V. urticæ*. As this seems to me a very quaint hibernating place for the Peacock and Small Tortoise-shell Butterflies, I thought the note might interest our readers.—HARPER GAYTHORPE, Prospect Road, Barrow-in-Furness, 21st Nov. 1900.

***Acherontia atropos* in East Cheshire.**—Since my note on Hawkmoths in East Cheshire (ante, p. 336) was written I have seen two more larvæ of the Death's Head. These were taken at the Hough, Alderley Edge, in the second week of October. Others were found about the same time by men working in the potato fields, but were killed, in the belief that they were 'young snakes'!

While writing, I may point out the obvious misprint of 'morning' for 'evening' on the last line of my previous note.—CHAS. OLDHAM, Alderley Edge, 5th November 1900.

THE YORKSHIRE BOULDER COMMITTEE AND ITS FOURTEENTH YEAR'S WORK, 1899-1900.

PERCY F. KENDALL, F.G.S., *Chairman.*

AND

J. H. HOWARTH, F.G.S., *Hon. Secretary.*

ALTHOUGH actual records may be less numerous than heretofore, a keen look out for any new facts is maintained by many watchful observers over a large area.

Several members of the Committee attended the excursion in July last of the Yorkshire Geological and Polytechnic Society into the Cheviot district, and they are now, in consequence, enabled to identify many of the East Coast erratics as from that area.

Mr. Stather reports rhomb-porphyry again at 650 feet above Ordnance datum at Stump Howe, eight miles west of Whitby.

Mr. John Burton has examined a rock exposure about 80 feet long at Hartley Bank, where the new branch railway is cut deep through the south bank of the river Calder into the valley. There were no striæ. This confirms, so far, previous statements that there is no evidence of a glacier in the lower Calder valley. It cannot, however, be definitely assumed that there never was one.

The coarse pisolite containing *Nerinæa,* reported by Mr. Kendall from Barugh Hill near Robin Hood's Bay, is believed to be of native origin, but its source is not known to the Committee. Perhaps some member will tell us where such rock can be found in situ. Mr. Kendall says that a similar limestone with *Nerinæa* is abundant in the drift along the North Cleveland watershed.

Reported by H. H. CORBETT, M.R.C.S., Doncaster.

CUSWORTH.

One dolerite.

Reported by P. F. KENDALL, F.G.S.

BARUGH HILL, NEAR ROBIN HOOD'S BAY.

Many boulders of porphyrite and two examples of a very coarse pisolite containing *Nerinæa.*

Thirley, near Cloughton.

Great gravel-mounds here are strewn with large blocks all of Jurassic sandstone, in numbers greatly exceeding what may be seen elsewhere in Yorkshire.

Whitby, cliffs to west of town.

A bed of gravel lying between two beds of boulder clay, the lower dark grey in colour, the upper reddish, contains the following rocks roughly in order of prevalence :—

Jurassic and other sandstones, magnesian limestone, carboniferous limestone, basalt, conglomerate (? sparagmite), greywacké sandstone (or ? sparagmite), jasper, alum shale (a large block), *Gryphæa incurva,* ball of red boulder clay.

Wheatcroft, near Scarborough. In corner of second field from road.

One Shap granite, 2 ft. long.

Seamer.

The gravels between Seamer quarries and Waydale House contain a very high proportion of basalts.

Seamer Beacon.

The tower here is built of rough blocks, mainly of Jurassic sandstone; but with large numbers of basalt or dolerite, and some Cheviot porphyrite.

Yedmandale.

A pit shows gravel consisting of local stones with many Cheviot porphyrites, some greywacké, jasper, and a few granite pebbles. Fragmentary marine shells are also found.

Hutton Bushell. In gravel pit on 200 ft. contour.

Many local stones with Cheviot porphyrites, magnesian limestone (Roker type), Kimmeridge clay, gneiss, granite.

Reported by J. A. Jordan, of Doncaster.

Gainsborough, Lincolnshire.[1] On Spital Hill.

One large block of Shap granite, the light variety.

One block of 'greenstone' (probably dolerite).

Reported by Wm. Simpson, F.G.S., *and* Robert Law, F.G.S.

Mytholmroyd. Raised terrace on south bank of river Calder, bounded on the west by Stubbs Clough and on the east by

[1] The Committee propose to record boulders outside the county which are intimately associated with and may serve to illustrate the dispersion of erratics in Yorkshire.

" Cragg Vale stream. On the south it abuts against the rising valley sides. 330 ft. to 360 ft. O.D.

Two sections were cut for the Yorkshire Geological and Polytechnic Society in the easterly slope of the terrace.

A great number of rounded boulders were dug out principally of quite local rocks, but 74 were picked out and were found on examination to be as follows :—

Galliard or ganister	18
Granophyres	18
Andesites	10
Rhyolites	8
Silurian grits	7
Vein quartz	5
Eskdale granite...	2
Volcanic ash	2
Carboniferous sandstone	2
Chert	1
Quartz felsite	1
	74

They ranged in size from about 6 in. × 4 in. × 3 in. to pebbles 1½ in. long, were embedded in a gravelly and sandy matrix, and were distributed equally throughout the sections.

Mr. J. W. Stather, F.G.S., furnishes the substance of a paper[1] read before the British Association at Bradford, which forms a valuable summary of the work done by the members of the Hull Geological Society and its general results to date.

The members have examined and tabulated upwards of 3,500 boulders of 12 inches and upwards in diameter.

But besides the larger boulders attention has been paid to the smaller stones of the drift, which have also yielded results of much interest.

With regard to the larger boulders (lists of which have been published in the reports of the Yorkshire Boulder Committee and of the British Association Committee) it has been sought to discover the proportion of rocks from distant sources, after the elimination of the secondary rocks of local derivation.

[1] 'The Source and Distribution of Far-Travelled Boulders of East Yorkshire.'

The following table, showing the boulders of two selected localities in the southern part of the Yorkshire Coast and two in the northern part, will serve to illustrate the general distribution :—

	Dimlington.	North Ferriby.	Whitby.	Saltburn.
	Per cent.	Per cent.	Per cent.	Per cent.
1. Carboniferous sandstones and limestones	55	59	70	73
2. Basalt (whin-sill)	32	30	24	20
3. Magnesian limestone ...	—	—	5	7
4. Granite, gneiss, etc. ...	13	11	1	0
	100	100	100	100

The investigation shows—(1) The proportion of Carboniferous sandstones and limestones increases northward. (2) The whin-sill increases southward proportionately though not numerically, probably bearing transport better than (1). (3) The magnesian limestone in the form of *large* boulders disappears southward. (4) The granites, gneisses, etc., decrease both proportionately and in numbers northward, except in the Shap granite and the Cheviot porphyrites, which show a rapid increase in the same direction. A considerable number of (4) agree with well-known rock types of Scandinavia, and these are more plentiful in the south of the county and in Lincolnshire than in North Yorkshire. The unknown rock types included in the same group agree in this respect with these recognisable Scandinavian rocks.

The distribution of the Cheviot porphyrites, which occur principally as stones and pebbles of smaller dimensions than the boulders of the above table, presents some points of peculiar interest. These, besides increasing in numbers towards their source, are also more abundant in the upper boulder clays and in the gravels at the highest levels; while, on the other hand, the Scandinavian rocks, either as pebbles or boulders, rarely occur in either position.

NOTES AND NEWS.

The increasing interest taken in the study of Astronomy has induced the Proprietors of 'Knowledge' to issue an annual for students and workers in that Science specially devoted to their requirements. It is entitled 'Knowledge Diary and Scientific Handbook, 1901,' and will contain, amongst other things, useful Tables, Original Articles, Calendar of Scientific Events, and a blank Diary portion.

NOTES—MOSSES.

***Leptobryum minus* Phil.**—It will interest the various readers who have received a specimen of this moss from me to read the diagnosis of it from two of our leading bryologists. Mr. Bagnall's opinion is given in 'The Naturalist' for September 1900.

Mr. W. E. Nicholson, of Lewes, says:—'As far as I can see your interesting *Leptobryum* must belong to *minus* Phil., whether as a species or as a variety. In any case it is fairly well marked. The characters of the fruit are not unimportant. There can be no doubt but that the outer peristome is shorter, and the inner imperfect. The cilia seem very imperfect, and without a trace of appendages. The long, delicate appendiculate cilia are quite conspicuous in my mounted specimens of *L. pyriforme*. The spores are certainly larger in your moss, and they appear to me to be finely punctuate, not so smooth as in *L. pyriforme*. The cells of the exothecium are a little smaller, and more incrassate, than in my *L. pyriforme*, but possibly the exposure might account for this.'

Mr. H. N. Dixon, M.A., F.L.S., of Northampton, says:—'I am very pleased to have the *Leptobryum minus*, although I do not feel able to accept its specific status. It is a marked form, and I should say constitutes a good variety, but I should hardly be disposed to go further. The size of the spores is certainly a point of importance; but they must vary considerably in *L. pyriforme*. Those I have examined averaged about 10 m., while your '*minus*' has them about 15 m. to 24 m. This seems a great distinction, but Limpricht (who describes '*minus*' as a var., without reference to the spores) gives the size of spores in *L. pyriforme* type as 14 m. to 20 m., so that the difference is considerably reduced.'—Wm. Ingham, York, 22nd October 1900.

A Few Sporadic Mosses of Yorkshire.—By sporadic mosses I mean those that have established themselves within a limited area, but have not found a permanent home there, and have the appearance to the bryologist of being out of their element. In July 1900, within a bend of the coast at Coatham Marshes, I came across a large extent of sand that looked quite brown by the multitude of capsules of the small moss called *Pottia Heimii*. This moss, which is known as a seaside moss, was luxuriating in what was evidently its natural home. It quite surpassed all other plants, and reigned supreme, attaining also its highest development there.

Now, I have found this sea-side moss settled on a wall at Thorp Arch, where it has been known for some time. Also, quite lately, I have found it by the side of a cinder-path, in shade, at Barkstone, near Sherburn-in-Elmet. It is plain that in both these places the moss is quite out of its element, and is struggling for existence. To my mind it seems clear that the wind has caught up the countless multitude of spores that are produced on Coatham Marshes, or similar sea-side places, and has wafted them to such places as Thorp Arch and Barkstone, where they have come to rest and produced the stragglers mentioned above. The spores are so small, thousands of them together forming what appears like a light stain to the eye, and are produced in such vast numbers, that it is conceivable they may be floating to any distance in the air.

On one of the large cinders thrown out from the ironworks at Coatham Marshes, I found one small tuft with fruit of the moss called *Ptychomitrium polyphyllum*. On a stone by the river Derwent at Kirkham Abbey I found the same moss. To find the home of this moss we must go to the siliceous rocks and walls of our mountainous districts, such as Teesdale and Weardale.

The common moss *Rhacomitrium lanuginosum* covers the stones of our mountain moorlands with its hoary carpets. I have found one tuft only of this on Strensall Common, and on Skipwith Common. The spores must have been carried to these commons by the wind, or they are lingerers from bygone colder conditions, when the plains would produce the same plants as now find their true homes only on the mountains.—Wm. Ingham, York, 22nd October 1900.

NOTE—COLEOPTERA.

Carabus cancellatus in Cheshire.—On the 28th of October I took a male and female of *Carabus cancellatus,* the first I have caught in Cheshire. I do not know if it is rare here.—B. R. LUCAS, 3, Dyer Terrace, Winnington, Northwich, 2nd November 1900.

NOTES—FLOWERING PLANTS.

The Ingleborough Juniper.—In looking over my specimens of *Juniperus* I find I have one, gathered on Ingleborough, 21st April 1897, which seems in almost every respect to answer Sowerby's description of *J. nana.* This plant is not recorded in Lees' Flora of West Yorkshire, and I do not know whether it has been recorded since the publication of the book.

The *habit of the plant* I cannot call to mind; as I simply took the specimen for *J. communis,* I did not think of noticing anything particular. But the leaves are shorter, broader, and more distinctly 'boat-shaped' than in specimens gathered on the chalk downs of the south of England; the acumination is much more abrupt, especially in the older leaves, and the incurvation and imbrication of the leaves approaches typical *J. nana.* The berries are as long as or longer than the leaves, and slightly longer than broad. It presents a very striking contrast to the south of England specimens of *J. communis,* and though I have not found *J. nana* in its better-known habitats, yet I do not doubt that this is what I gathered—perhaps not quite typical in form—on Ingleborough in 1897.—H. J. RIDDELSDELL, St. Michael's College, Aberdare, South Wales, 24th October 1900.

J. nana is a mere variety of *J. communis.* It occurs in a typical form, dwarf and adpressed to the rocks on the limestone pavement of Whitbarrow and the other limestone hills south of Kendal, the vegetation of which is very similar to that of Ingleborough.—J. G. BAKER.

Extraordinary Number of Wild Flowers in November.—To-day, in a ramble from South Elmsall through Brodsworth and to Adwick-le-Street, no less than 49 species of wild flowers were noted. This seems to me to be a record worth making for the first day of November 1900. A full list is appended:—

Ranunculus acris.
Ranunculus repens.
Sisymbrium officinale.
Brassica oleracea.
Bursa bursa-pastoris.
Raphanus raphanistrum.
Reseda luteola.
Viola arvensis.
Lychnis alba.
Cerastium triviale.
Stellaria media.
Sagina procumbens.
Trifolium pratense.
Trifolium repens.
Rubus rusticanus.
Rubus corylifolius.
Pimpinella Saxifraga.
Conopodium denudatum.
Chærophyllum temulum.
Angelica sylvestris.
Caucalis Anthriscus.
Hedera Helix.
Sherardia arvensis.
Scabiosa succisa.
Scabiosa arvensis.
Bellis perennis.
Achillea Millefolium.
Chrysanthemum Leucanthemum.
Matricaria inodora.
Senecio vulgaris.
Senecio Jacobæa.
Carduus nutans.
Carduus lanceolatus.
Carduus palustris.
Centaurea nigra.
Centaurea Scabiosa.
Lapsana communis.
Leontodon hispidus.
Leontodon autumnalis.
Taraxacum officinale.
Sonchus oleraceus.
Campanula glomerata.
Campanula rotundifolia.
Veronica Tournefortii.
Stachys sylvatica.
Lamium album.
Rumex conglomeratus.
Euphorbia Helioscopia.
Euphorbia Peplus.

—H. H. CORBETT, 9, Priory Place, Doncaster, 1st November 1900.

NOTE—FUNGI.

Large Fairy Rings at Fillingham Castle.—In compliance with Mr. Crossland's suggestion that, in recording 'fairy rings,' the soil and position, etc., where they are met with, should also be noted, I write to say that the land behind the castle, where the giant 'fairy rings' occur, appeared to me to be of a rough, poor nature; but to make sure I wrote to Mrs. Portman-Dalton, who takes an interest in such matters and is a good observer, and asked her about it. In reply she writes:—'My husband says that there is no sand or gravel in the soil in the park here. It is red earth on limestone, and very near the rock. We have ploughed up so much of the park, as the grass was so tussocky and harsh nothing would eat it. Where you saw the 'fairy rings' it is always mown for hay.'

To this I can only add that Fillingham Castle stands on the verge of the Oolite cliff in Lincolnshire, about 200 feet above sea level, overlooking the Liassic plains below, and that behind the castle, to the east, the park is practically level; while the land there, which is open and dry, is full of the dwarf plume-thistle—*Cnicus acaulis*, with the devil's-bit scabious, *Scabiosa succisa*, and strong tufts of coarse, wiry grass.

On my own pasture fields at Gainsborough, which lie on the rich Keuper Marls, 'fairy rings' are numerous; but they are all of the usual moderate size, and the circle of the larger ones is seldom complete.

I have never noticed any other agarics, either inside the rings or growing with *Marasmius oreades*: a state of things which, so far, tends to show that the mycelium of this fungus does better in a poor than in a rich soil.—F. M. Burton, Highfield, Gainsborough, 16th November 1900.

NOTE—MARINE MOLLUSCA.

***Acmæa testudinalis* on the Yorkshire Coast.**—In 1852 a friend from Forfarshire sent me a few shells of this pretty Limpet; their beautiful form and markings interested me greatly, and in 1887, when the programme of the visit of the Yorkshire Naturalists' Union to Saltburn was distributed, I noticed one item of special interest to me—'*Acmæa testudinalis*, fine.' I had not heard then of its southward rambles, so decided to go to the excursion and look for it. As soon as the tide was run out I spent all the afternoon on the rocks and was fortunate in finding two very fine and much larger specimens than those I had from Scotland. In September of the same year I spent a day at Runswick and got four good shells. In 1888 I searched Whitby Scar and found three moderate specimens. In 1896, being at Sandsend for a few days, I had a long search, and was successful in finding what appeared to be the headquarters of the species for the district. The shells were here much larger than any I had seen, but wretched specimens—all the outer coat of enamel and markings corroded and eaten away; no one without an 'educated eye' could have picked them out from the ordinary Limpet. The most singular thing was that the common species was unaffected, except that it was in greater variety of marbling and coloration than I have seen it elsewhere. The two species lay together in the course of a very shallow stream that issues from the cliff above, and owing to the formation of the scar, the water, heavily charged with a white sediment, flows over a considerable area and affects the shells so differently. The site is the last to be uncovered and the first to be covered at the ebb and flow of the tides, when the volume of water will neutralise or absorb the powerful salt that does so much damage in so short a time. The people at Sandsend want a company promoter and a spa all their own. Being anxious to connect all the available stations on the coast I called at Staithes and Robin Hood's Bay, but the very primitive character of the drainage schemes in force at each place makes it imperative that one should choose a cool day with the wind from the sea, conditions of weather very unfavourable to successful search for *Acmæa testudinalis*. Jno. Braim, Pickering, 29th October 1900.

NOTES—ORNITHOLOGY.

Late Stay of Swifts near Harrogate.—On Friday, 16th November, I saw two Swifts flying over a field between Starbeck and Bilton Woods. In the trees immediately underneath several Hooded Crows were cawing, two extremes, north and south, thus meeting.

I have frequently seen Fieldfares (*Turdus pilaris*) feeding on the fields, and Swallows (*Hirundo rustica*) skimming over their surface, both in the spring and autumn, but have never before seen the *Corvus cornix* and the *Cypselus apus* so near together.—K. McLean, Harrogate, 19th Nov. 1900.

Red-crested Pochard in Cleveland.—In 'The Naturalist' for October (p. 304) occurred a short note under my signature on the occurrence of a Red-crested Pochard in Cleveland. It was copied from a Yorkshire daily paper, the name of which I could not give, as the account was on a clipping or cutting sent to me by a friend. I have since ascertained that this account, which also appeared in a Middlesbrough weekly journal, is incorrect, and that Mr. T. H. Nelson's record in 'The Naturalist' for October (p. 304) and November (p. 322) is the correct one.—J. W. Fawcett, Satley Grange, 2nd November 1900.

Great Crested Grebe on the River Ancholme.—I saw a specimen of this bird (*Podiceps cristatus* L.) on the river Ancholme between Brandy-Wharf and Bishop-Briggs. This is the first time I have seen this bird in Lincolnshire, but Cordeaux gives it as a visitor. The bird was either moulting or was a young bird of the year.

The local name for it is 'Gaunt.' We have a local family who are said to take their name from this bird. The family now spell it Gant, but fifty years ago the spelling was always Gaunt. Grebe Gaunt was a noted horse-breaker some fifty years ago.—Max Peacock, Bottesford, viâ Doncaster, 6th September 1900.

Partridge in the Streets of York.—About 6.15 a.m. on the morning of the 16th October a plump specimen of this species (*Perdix perdix*) was captured in Coney Street, York. The bird came out of a passage and ran from its captor, and, after a short but sharp chase, took refuge in a doorway, where it was secured. A subsequent careful examination failed to trace any wound, and it had every appearance of being in the best of health. I imagine it had flown in from the neighbouring country during the night (like many another rural visitor to the cities, never to return again). The previous night was, for the time of year, very frosty.—William Hewett, 12, Howard Street, York, 25th October 1900.

Golden Oriole near Scotton Common.—On the 4th September last my son cycled over to Scotton Common with a friend in search of caterpillars, and was rewarded by finding those of *Clostera reclusa* on the tips of the low sallows, *Notodonta ziczac*, and the beautiful larva of *Apatela leporina*, with its mantle of long silky hairs covering its back like a veil; besides others which await identification.

On their return I was told they had seen a large bird, of a brilliant yellow colour, flying about the trees on the far side of a field, adjoining the road leading to and not far from the common. They got off their cycles to watch it, and, as they were standing, hidden by the hedge on the road-side, it came almost directly over them, and on my showing them the figure of the Golden Oriole (*Oriolus galbula*) they identified it without hesitation.

It is interesting in these days, when so many birds have been driven from our land, to be able to record the appearance of rare visitors; but is it wonderful? Is it not rather to be expected that with gun licenses, bird and egg protection by law, and private and public associations—to say nothing of the present rage for ornithological study in general—some of the birds we have lost, and which were once common in our midst, may return? Let the County Councils do their work. Let the 'Bird Acts' be put in full force everywhere, and the societies for bird protection encouraged, and then we are sure to see many rare birds, which we have driven away by our stupid persecution and love of slaughter, come back to their haunts again.—F. M. Burton, Highfield, Gainsborough, 19th November 1900.

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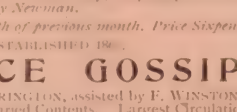

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The Editors have again to thank their contributors and their subscribers for the support which they have given.

They have a large number of articles and notes in hand, and only need more financial help to enable them to enlarge the journal, as is most desirable.

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W. Eagle Clarke.—Bird Migration in Great Britain and Ireland, Third Interim Report of the B. A. Committee, 8vo. reprint, 1900. [The Author.
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FOR 1901.

TORTULA CERNUA:

A MOSS NEW TO THE BRITISH FLORA.

CHAS. P. HOBKIRK, F.L.S.,

Ilkley; Ex-President of the Yorkshire Naturalists' Union.

Mr. George Webster, of York, has the honour to be the fortunate finder of this, the latest addition to the British Moss Flora—*Tortula cernua* (Hueb.) Lindb. (*Desmatodon cernuus* Bry. Eur.). Mr. Webster met with it at the end of September last, in the West Riding of Yorkshire, in small quantity only, on the magnesian limestone near Aberford. This moss is not included in Wilson's 'Bryologia Britannica' (1855), nor in the more recent 'British Moss-Flora' of Dr. Braithwaite; therefore, as far as we are aware, it is new to the British Isles.

Schimper gives the time of its fruiting on the Continent (fruct. matur.) as July and August, and Mueller, whose records are mostly sub-Arctic, as towards the end of summer; so that next season it should be looked for through the limestone district, say eastwards from Aberford towards Church Fenton, and northwards from Sherburn to Grimston Park and Tadcaster, particularly in the old disused, damp, limestone quarries, such as Jackdaw Crag Quarry, near Stutton, and others which are frequent in the narrow band of magnesian limestone which extends from Shireoaks northwards, through Knottingley, Tadcaster, Wetherby, Knaresborough, and Ripon to West Tanfield. When we consider that this species has such a wide range in Europe, as well as in Canada and the United States, it seems strange that it should so long have escaped the observation of our British bryologists. It is really a very well-marked and distinct species, and is easily distinguished from all its congeners. Lindberg, in his 'Natural Arrangement of Mosses' (Musc. Skand., 1879), places it in the family *Tortulaceæ*, genus *Tortula*.

sect. *Desmatodon,* and next to the well-known *T. muralis,* with which it has considerable affinity in the form and structure of its leaves, but differs by its cernuous stumpy capsule with a short beak and scarcely (if at all) twisted peristome, the latter being quite typical of the old genus *Desmatodon.* There is a good description of it in Schimper's 'Synopsis,' Ed. ii., and perhaps a better still in Mueller (for references see Synonymy below), but Schimper says of the leaves 'margine subplana,' which is scarcely sufficiently definite according to our specimens, and Mueller's 'margine inferne revoluta' is much more explicit and describes our plant exactly. There can be no doubt of the correctness of the determination, as both Mr. M. B. Slater and myself have very carefully examined it, and it is confirmed by Dr. Braithwaite; and it has also been carefully compared with Dr. Schimper's specimen from the Salzburg Alps, in the late Dr. Spruce's herbarium.

From the records of its distribution it will be observed that it is in the main an Arctic and Alpine species, preferring limestone, and therefore its occurrence at so comparatively low a level in Yorkshire is somewhat remarkable. Now that attention has been called to it, it is very possible that next season it may be detected by some of our active bryologists in other districts of Great Britain, but as it ripens its fruit in summer, it could hardly be recognised during the winter and spring months.

An idea of the very wide distribution of this species will be gathered from the following published records:—Starting in the far East, Mitten records it from the Alpine regions of Eastern Thibet, gathered by T. Thompson; in Europe we have it from the Alps of Germany, Austria, Switzerland, and Italy, e.g., Schleherngebirge (Treviranus): prope Juvaviam (Sauter); in monte Kramer prope Partenkirchen, 5,000 feet (Arnold); near Meran (Bamberger) and near Trafoi (Schimper), both in the Tyrol; in the Valley of Aosta, St. Bernard; and in the Salzburg Alps (Schimper), in herb. Spruce; also on the Island of Langöen, Finmark, on the sandy marge of the glacial sea (Wahlenberg), and numerous other places in Sweden and Norway; in North America, from the Rocky Mountains (Drummond); in Canada, at South-West Point, Island of Anticosti; Campbelton, New Brunswick; along the Pembina River, N.W. of Edmonton, N.W. Territory; Câche Creek Mountain; in a ravine at Kamloops in British Columbia (Macoun); and in Greenland (Flora Grœnl.).

SYNONYMY :—

Cynodontium latifolium Schwæg. Supp. I. I. p. 110. t. 28. 1811.
Didymodon latifolius Wahl. Fl. Lapp. p. 313, t. 20. 1812.
Didymodon latifolius Hook. In Drum. Musc. Amer. no. 115.
Anacalypta inclinata Nees. MS.
Cynodon latifolius Brid. Bryol. Univ. I. p. 502. 1826.
Desmatodon inclinatus Sendt. In Regensb. Denkschr. p. 144. 1841.
Desmatodon cernuus Hueb. Musc. Germ. p. 117. 1833.
Desmatodon cernuus Br. & Schpr. Bryol. Eur. II. t. 134. 1842.
Desmatodon cernuus Mitt. Musc. Ind. Orient. p. 37. 1859.
Desmatodon cernuus DeNot. Epil. Bri. Ital. p. 572. 1869.
Desmatodon cernuus Schpr. Syn. Ed. II. p. 186. 1876.
Desmatodon cernuus Lesq. & James. Mosses of N. Amer. 114.
Desmatodon cernuus Husnot. Musc. Gall. I. p. 94. t. 26. 1884-90.
Trichostomum inclinatum Muell. Syn. I. p. 593. 1849.
Trichostomum cernuum Lindb. Eur. Trich. p. 14. (? 1864).
Trichostomum cernuum Milde. Bryol. Siles. p. 100. 1869.
Tortula cernua (Hueb.) Lindb. Musc. Skand. p. 20. 1879.

NOTE—NEUROPTERA.

Neuroptera taken at Bottesford, Lincolnshire.—The following species have been taken by me on or about 21st May 1900, and named by the Rev. A. Thornley:—*Sialis lutaria, Ephemera vulgata.*—MAX PEACOCK, Bottesford, 12th July 1900.

NOTE—ORNITHOLOGY.

Bird-Notes, Brigg District, North-west Lincolnshire.—The mild weather of the present autumn has induced insect life to prolong its stay, therefore our insectivorous avian summer migrants are still with us. As long as the birds can obtain food they stay.

To-day (12th October 1900) Swallows (*Hirundo rustica*) and House Martins (*Chelidon urbica*) are still here in some numbers. One nest (Swallows') contains young yet, but they are just on the point of taking wing.

The last Landrail (*Crex crex*) I put up on 9th October.

Garganey Teal (*Querquedula querquedula*). Nine of these beautiful ducks may be seen swimming on the pond that has been their home and nursery this season. I saw them yesterday; they were spending their time in hunting the aquatic insects that were dancing on and above the water.

Nightjar (*Caprimulgus europæus*). Two put up 11th October, looked like young of the year.

Stone Curlew (*Œdicnemus œdicnemus*). Our local-bred birds have had their numbers augmented. Now nineteen are to be seen. In the place where they spend their time during the day I found several castings which I believe are ejected by them. Some of these I brought away for examination later. The 6th or 7th of the month is the date when these birds usually leave us for their winter quarters. They are remarkably regular in their habits, and come back again in the spring to a day. 12th and 13th May have invariably seen the first pair located for the summer.

Here, in Lincolnshire, a heavy sea-roak came in from the east on the night of the 10th, and hung over the country until 11.30 of the 11th. Along with the fog came the Woodcock (*Scolopax rusticola*) and Snipe (*Gallinago cœlestis*). I put both up in very unlikely spots. The migration inland has been a remarkably heavy one.—MAX PEACOCK, The Manor, Bottesford, Brigg, 12th October 1900.

NOTES—MOLLUSCA.

***Octopus* on the Cleveland Coast.**—On Sunday, 29th July 1900, a small *Octopus* was found stranded on the beach at Redcar, and considerable interest was attached to its capture, the creature being generally a native of warmer climates, and seldom found so far north.—J. W. FAWCETT, Satley, Darlington, 21st September 1900.

***Testacella scutulum* in Leeds City.**—On the 1st of November the atmosphere and the ground were completely saturated with moisture, so much so that numbers of slugs were forced out of the ground to perambulate in open air. Mr. Oliver Marsden observed a number of *Testacellæ* crawling about on the pavement and garden walls in Hyde Park Road, between the Woodhouse Moor Wesleyan Chapel and the corner of Moorland Road. He sent me two, which proved to be *T. scutulum*, Mr. John W. Taylor confirming the determination.—W. DENISON ROEBUCK, 259, Hyde Park Road, Leeds, 10th November 1900.

***Helix virgata* in the Louth District.**—As Mr. H. W. Kew mentions *Helix virgata* (with *H. cantiana*) as being 'altogether absent from the Louth neighbourhood' ('Naturalist,' June 1896, p. 174), it may be of interest to note that *H. virgata* is to be found plentifully at Red Hill, near Goulceby. Specimens of varieties collected there I sent to Mr. J. W. Taylor, Leeds, who kindly identified them as var. *alba*, which I found fairly common with and without translucent bands; 'an approach to *subalbida*'; 'a dark form of the var. *subdeleta*'; and 'an approach to var. *minor*.' It may also be of further interest that on 1st September I found the following in copulation:—*H. virgata* type and var. *subdeleta*; var. *subdeleta* and var. *alba* (with translucent bands); var. *alba* (translucent banded form) and type.—C. S. CARTER, 172, Eastgate, Louth, Lincolnshire, 7th November 1900.

Plague of Dew Slugs at Bottesford.—On the 25th of September 1890, I sowed the fishpond field at the Warp Farm, Bottesford, N.W. Lincolnshire, with Scholey's wheat. The seed germinated well and came up an excellent crop, braiding well. During the following winter my friends often remarked on the healthy look of the plant. This continued to be the case until the middle of March, when all at once I noticed a great change for the worse on the eastern side of the field. This soon spread across the whole extent of the piece. On examination we found a vast army of Dew Slugs (*Agriolimax agrestis*) cutting off the young plant near the ground. We tried rolling the field, but this did not seem to do much good, although thousands were killed. For one that perished beneath the rings of a Cambridge roller a thousand more seemed to spring out of the ground. During the day the host of the enemy retired into worm holes or under small clots of earth. It was in the early morning and evening when the dew was on the plant that the enemy came forth to slay my crop. However, I had neighbours at hand who could master the pest. The Black-headed Gulls, or, I suppose I ought to say, Brown-headed Gulls (*Larus ridibundus*), came to my aid and soon cleared away the noxious marauders. These birds came in thousands from the gull-ponds at Twigmoor, Scotton Common, and Crosby Black Rabbit Warren. So heartily did some of my neighbours feed that they were unable to fly. The field at that time looked as if it had been eaten down with sheep—only a few withered blades were to be seen. I made up my mind to plough it up and drill oats in its place, but gave it a few days' grace to see if the plant would shoot again. In a few days from the gulls coming I could see a vast improvement, and in ten days the field was again green, so I let it stand. At harvest time this field produced by far the best crop. I had six quarters per acre on it against five, or even less, in my other fields. The sample of corn was out and out the best I saw that season shown at our local markets.—MAX PEACOCK, The Manor, Bottesford, Lincolnshire, 7th July 1900.

NATURAL HISTORY NOTES FROM WHITBY.

February 1898 to November 1900.

THOMAS STEPHENSON,

Whitby.

MAMMALIA.

1898 April 23.—***Lutra lutra.*** **Otter.** One was seen in the river Esk, near Sleights Bridge.—Whitby Gazette, 29th April 1898.

May.—***Lutra lutra.*** **Otter.** A trio is reported to have been observed, by a rural postman, sporting in the dam at Ruswarp late on Wednesday evening.—Whitby Gazette, 6th May 1898.

Aug. 29.—***Phocæna phocæna.*** **Porpoise.** One was brought into Whitby by Messrs. Kelly & Richardson ; it had got in the herring-nets.

1899 July 31.—***Phocæna phocæna.*** **Porpoise.** One was caught in the nets and brought into Whitby.

Aug. 12.—***Pipistrellus noctula.*** **Noctule Bat.** I saw four flying about near the Coastguard Battery.

1900 March 12.—***Talpa europæa.*** **Mole.** A light grey-coloured one, with yellow head and rump, was captured at Bedale, Yorkshire, and brought to me by Mr. Oxley Grabham ; it has been preserved and placed in the Whitby Museum.

July.—***Lutra lutra.*** **Otter.** On Friday last week, a very fine specimen, measuring 3 feet 10 inches in length, was found on the banks of Ruswarp Dam, near Carr Cottage, having apparently been shot.—Whitby Gazette, 6th July 1900.

July 12 and 13.—***Pipistrellus noctula.*** **Noctule Bat.** Two were seen from the West Pier near the look-out.

July 24.—***Phocæna phocæna.*** **Porpoise.** One was caught in the nets by Henry Freeman and brought into Whitby.

AVES.

1898 May.—***Crex crex.*** **Landrail** or **Corncrake.** This was heard near Love Lane on Sunday, at Esk Valley on the same day, and at Lealholm on Tuesday.—Whitby Gazette, 6th May 1898.

July.—***Larus ridibundus.*** **Black-headed Gull.** Saw several.

1901 January 2.

1898 Oct. 5.—***Vanellus vanellus.*** **Green Plover.** I saw a very large flock in Middleton's field, near Summerfield Lane, Stainsacre.

Oct. 20.—***Larus marinus.*** **Greater Black-backed Gull.** Four were seen in Whitby Harbour by many people. Henry Freeman said he saw four on the Bell.

Oct. 21.—***Larus fuscus.*** **Lesser Black-backed Gull.** One seen which appeared to me to be this species from the size of it, but I could not clearly discern the markings.

Oct. 27.—***Alcedo ispida.*** **Kingfisher.** I saw one in Whitby Harbour; it flew under an arch of Whitby Bridge and went up the river.

Nov.—**Wild Geese.** The largest flock ever seen to cross the Ugglebarnby district, over which an annual flight takes place, was witnessed on Monday at noon, when a cloud of not less than 150 darkened the sky as they passed.—Whitby Gazette, 11th November 1898.

1899 Feb. 22.—***Larus minutus.*** **Little Gull.** A mature specimen was observed in Whitby Harbour.

Feb.—***Caccabis rufa.*** **Red-Legged Partridge.** Two were captured near Brunswick Street, in Whitby.

April.—***Hirundo rustica.*** **Swallow.** Was seen at Cross Butts on Sunday, and again by Mr. Ford at Lyth the following day.—Whitby Gazette, 28th April 1899.

April.—***Cuculus canorus.*** **Cuckoo.** Mr. Elisha Long reports having heard one on his farm, Rock Head, Glaisdale, on Monday.—Whitby Gazette, 28th April 1899.

April.—***Crex crex.*** **Corncrake** or **Landrail.** One was heard on Monday at Woodlands, by Mr. H. K. Williamson.—Whitby Gazette, 28th April 1899.

April.—***Ruticilla phœnicurus.*** **Redstart.** One was seen on Monday at Woodlands, by Mr. H. K. Williamson.—Whitby Gazette, 28th April 1899.

May 3.—***Cuculus canorus.*** **Cuckoo.** I heard one this day at Crowdy Hall, near Larpool.

May 10.—***Crex crex.*** **Landrail.** I heard one in Factory Fields.

May 10.—***Muscicapa atricapilla.*** **Pied Flycatcher.** Was seen frequently in Springhill garden by George Ventriss.

Oct. or Nov.—**American Summer Duck.** Three out of a flock of eight were shot on Ruswarp Dam by — Pedman.

1900 Feb. 17.—***Larus minutus.*** **Little Gull.** One was seen in Whitby Harbour with a flock of about 80 Black-headed Gulls (*Larus ridibundus*).

Feb. 27.—***Larus minutus.*** **Little Gull.** One seen in the harbour.

March 1.—***Mergulus alle.*** **Little Auk.** One was picked up from the sands by Mr. J. Hall.

March 20.—***Hirundo rustica.*** **Swallow.** A couple were seen at Glaisdale on Tuesday.—Whitby Gazette, 23rd March 1900.

April 18.—***Gecinus viridis.*** **Green Woodpecker.** I heard one call several times in Woodlands, near Aislaby.

April.—***Cuculus canorus.*** **Cuckoo.** One was heard in Carr Hall Woods by a rural postman on Monday last.—Whitby Gazette, 20th April 1900.

May.—***Crex crex.*** **Landrail** or **Corncrake.** This species has arrived. It was heard on Sunday in the Factory Fields, and on the same day at Ugglebarnby.—Whitby Gazette, 4th May 1900.

May.—***Larus fuscus.*** **Lesser Black-headed Gull.** A rare species in this locality. One was seen in Whitby Harbour on Wednesday morning, and again on Thursday afternoon. —Whitby Gazette, 11th May 1900.

May.—***Phalacrocorax carbo.*** **Cormorant.** Whitby Harbour is visited every morning about two or three o'clock by a flock of Cormorants. They come by way of the East Cliff and Spa Ladder, and take their fill of whatever fish they can find in the upper harbour, doubtless not forgetting the nimble trout.—Whitby Gazette, 25th May 1900.

Aug. 26.—***Larus marinus.*** **Greater Black-backed Gull.** One was observed by me swimming in Whitby Harbour among a number of Herring Gulls (*Larus argentatus*).

Sept. 2.—***Fulmarus glacialis.*** ***Fulmar Petrel.*** One was washed up on the beach at Kettleness.—J. H. Wilson.

Sept. 4.—***Totanus canescens.*** **Greenshank.** One was shot near the Batts in Whitby Harbour by — Stageman.—J. H. Wilson.

Sept. 4.—**Wild Geese.** A large flock passed over Castleton on Saturday night last, being well within reach of the gun. They were making southwards.—Whitby Gazette, 14th September 1900.

1900 Nov. 10.—***Plectrophanes nivalis.*** **Snow Bunting.** A fine male was seen this day near Kettleness by Mr. J. H. Wilson, Baxtergate.

REPTILIA.

1900 Sept. 5.—***Vipera berus.*** **Viper** or **Adder.** Whilst crossing the road near Newbegin one was run over by Mr. F. Agar on his bicycle and killed. It was a beautifully-marked specimen, and measured 1 foot 8½ inches in length.

FISHES.

1898 March 26.—***Zeus faber.*** **John Doree.** A small specimen was washed up on the sands during a N.E. gale.

June 16.—***Clupea sprattus.*** **Sprat.** A very large shoal was noticed in the harbour this day swimming near the Coffee House end. A fisherman (Pounder Robinson) threw a net over the pier side and succeeded in hauling ashore a large kitful.

July.—***Nerophis ophidion.*** **Straight-nosed Pipe-fish.** One was taken in Whitby Harbour. This species is the 'Snake Pipe-fish' of Couch.

Aug.—***Alopecias vulpes.*** **Shark.** On Wednesday afternoon, when a waterman was walking round the rocks in the vicinity of the s.s. Glentilt, he found a large Shark evidently left by the tide. It was nearly dead when found, and bleeding very much. It measures 14 feet 6½ inches in length, and 5 feet round, its tail measures 7 feet, and the two fore fins 2 feet each. The monster is now on view on the sands at Kettleness, and a charge of 3d. is being made to repay the men for their trouble in taking it round the rocks to a convenient place for visitors.—Whitby Gazette, 26th August 1898. From a photograph by Watson, of Lyth, I conclude that it was a Fox Shark or Thrasher (*Alopecias vulpes*).

Sept. 18.—***Lophius piscatorius.*** **Angler.** One was captured in Whitby Harbour; on being opened its stomach was found to contain from 15 to 20 flat fish.

Sept. 20.—***Lamna cornubica.*** **Porbeagle** or **Beaumaris Shark.** A Staithes fisherman, named William Cole, had an unusual and exciting experience this morning when out with his coble, the 'Anchor of Hope.' When about six miles off Whitby he was taking in his nets, but was surprised and perplexed to find that a Shark had become entangled in the meshes. For some time the uncanny

monster struggled to break away, lashing about and snapping its jaws in its frantic efforts to escape. The net, however, though badly torn, served its purpose well and withstood the terrible strain until the Shark, all its energies spent, was overcome. With the aid of rigged-up tackle the fish was carefully taken into the boat, and proved to be a valuable specimen, being in splendid condition, measuring 6 feet 9 inches, and weighing over 15 stones. Later in the day it was brought to Whitby and exhibited.—Whitby Gazette, 23rd September 1898.

1898 Sept. 28.—***Galeus canis.*** **Common Tope.** Two specimens were caught off Whitby, on lines baited with herring, and brought into the harbour.

Sept. 28.—***Acanthias vulgaris.*** **Picked Dogfish.** This was also caught on the lines and brought into Whitby.

Oct. 11.—***Lamna cornubica.*** **Porbeagle** or **Beaumaris Shark.** A large one was captured by Thos. Langlands in the herring nets off Huntcliff and brought into Whitby Harbour. It measured between 7 feet and 8 feet in length.

Nov. 9.—***Pleuronectes limanda.*** **Dab.** A fine specimen was caught from the West Pier end by a young man named Wale. It weighed 2¼ lbs., and measured from the nose to the outer edge of caudal fin 17 inches, and across the body (one side) 6½ inches exclusive of fin on either side.

1899 Jan. 14.—***Labrax lupus.*** **Basse.** One was caught on a trout line by some lads; it measured in length 11 inches.

Jan. 26.—***Labrus maculatus.*** **Ballan Wrasse.** One was caught off and brought into Whitby; it measured in length 16 inches.

July.—***Alopecias vulpes.*** During the last few days an exceptionally large number of Porpoises (*Phocæna phocæna*) and Thrashers or Fox-Sharks (*Alopecias vulpes*) have been seen chasing the **Salmon** (***Salmo salar,*** etc.) inside the Rock Buoy and Sandsend Bay.—Whitby Gazette, 21st July 1899.

July 24.—***Lophius piscatorius.*** **Angler-fish.** A large specimen was caught off Whitby and brought into the harbour.

July 25.—***Lamna cornubica.*** **Porbeagle** or **Beaumaris Shark.** A small one was caught in the herring-nets by — Cole, of Staithes.

Aug.—***Mullus barbatus.*** **Red Mullet.** One was caught by Isaac Unthank, about four miles from land, and landed at Whitby; it weighed about 2¾ lbs.

1899 Aug.—***Salmo trutta.*** **Salmon Trout.** There has been a good delivery of Salmon Trout during the week, and, taken on the whole, the season is computed to be one of the best experienced for some years. On Wednesday morning a record catch was made by Messrs. Leadley & Harrison's coble, 104 fine fish being landed in two castings of the nets. The average price realised was 9d. per lb.—Whitby Gazette, 4th August 1899.

Sept.—***Clupea harengus.*** **Herring.** The catches were so heavy a few nights ago off Staithes that several cobles each lost some nets.—Whitby Gazette, 15th September 1899.

Nov. 16.—***Lamna cornubica.*** **Porbeagle** or **Beaumaris Shark.** A large one, measuring a little under 8 feet in length, was brought into Whitby Harbour by the fishing coble 'Hannah Mary,' owned by Messrs. Colley & Hutchinson. It was secured about three miles from the port after a stiff struggle, having been completely wrapped round and round by the fishing-line. It was exhibited on the pier.

1900 March 8.—***Gastrosteus spinachia.*** **Fifteen-spined Stickleback.** One was this day picked up from the sand by Mr. Oxley Grabham and brought to me.

April.—A Fish's Curious Meal.—While engaged in fishing, about two miles outside the Rock Buoy, on Thursday last week, Mr. I. Langlands, coxswain of the Whitby lifeboat, landed a fish from the mouth of which two feet of a rabbit were protruding. On examination it was found that the animal, which was about half grown, had been taken whole by the fish. It had evidently been swallowed not long before, as it was in perfect condition.—Whitby Gazette, 27th April 1900.

May.—***Salmo salar.*** **Salmon.** First Catch of Salmon.—On Tuesday the coble 'Samarian,' owned by Mr. Robert Allan, of West Hartlepool, landed the first catch at Whitby this season. The catch consisted of three fish—one of 6 lbs., and two of 5 lbs. each. The price realised for the fish was 2s. per lb.—Whitby Gazette, 25th May 1900.

June 14.—***Rhombus punctatus.*** **Muller's Topknot.** One, 8½ inches long, was caught in the salmon-nets by — Grier.

June 29.—***Labrax lupus.*** **Basse.** One, measuring in length 22½ inches, was caught in the salmon-nets.

1900 July 12.—***Rhombus punctatus.*** **Muller's Topknot.** One, about 7½ inches in length, was caught by — Hartley in the salmon-nets.

July 25.—***Galeus canis.*** **Common Tope.** One was caught by Hansill and brought into Whitby.

Aug. 22.—***Clupea finta.*** **Rock-Herring** or **Twaite Shad.** One was caught off Whitby and brought to me. It is now preserved in the local museum. It is stated in Yarrell's British Fishes, Vol. 2, p. 211, that Dr. Parnell says, on the coast of Scotland, the Twaite Shad receives the name of Rock Herring.

Aug. 30.—***Galeus canis.*** **Common Tope.** One was caught in salmon-nets and brought into Whitby Harbour.

Aug. 30.—***Acanthias vulgaris.*** **Picked Dogfish.** Two were caught off Whitby.

Aug. 30.—***Nerophis ophidion.*** **Straight-nosed Pipe-fish.** One was washed up on the beach by the tide; the Snake Pipe-fish of Couch.

Sept. 10.—***Lophius piscatorius.*** ***Angler.*** One, measuring about three feet in length and weighing just over three stones, was captured by William Gaskin in his shrimp-net whilst shrimping in Whitby Harbour.

MOLLUSCA.

1900 June 26.—***Loligo vulgaris.*** **Calamary, Squid,** or **Sleeve.** One was caught off and brought into Whitby and exhibited on the pier.

CRUSTACEA.

1898 July 26.—***Galathea strigosa.*** A very fine specimen was captured off and brought into Whitby.

1899 Feb. 14.—***Cancer pagurus.*** **Crab.** The first catch at Whitby this season took place on Tuesday afternoon, when Mr. B. Weatherill landed about eight kits of splendid quality. Each kit contained from 20 to 40 crabs according to size, and they realised an average price of 5s. 3d. per kit.—Whitby Gazette, 10th February 1899.

NOTE—NEUROPTERA.

***Platetrum depressum*, a Dragonfly New to Yorkshire.**—Mr. Wm. Hewett has given me a specimen of *Platetrum depressum* which he captured on Sandburn Common, York, on 26th July last. It is a common South of England species, but does not hitherto appear to have been recorded for our own county.—Geo. T. Porritt, Crosland Hall, near Huddersfield, 26th November 1900.

NOTES—ORNITHOLOGY.

Albino Jay at Acaster, near York.—A beautiful albino variety of the Common Jay (*Garrulus glandarius*) was shot last July by Dr. Raimes, of York, in Stubbs' Wood near Acaster, York. The bird is an immature specimen.—WILLIAM HEWETT, Howard Street, York, 27th October 1900.

Raven on the Cheviots.—Mr. Alexander Martin, of Belford, in a note to the 'Newcastle Weekly Chronicle' of 22nd Sept. 1900, states that while out Grouse shooting on 8th Sept., on Hygip, he saw a pair of Ravens (*Corvus corax*) fly off the summit of the Cheviot, and hover round the valley below, uttering their harsh 'Crok, crok' call.—J. W. FAWCETT, Satley, Darlington, 2nd November 1900.

Little Gull at Redcar.—I picked up an immature bird of this species (*Larus minutus*) on 29th Sept. last, washed in by tide (quite fresh), near Redcar Jetty, Yorkshire side of the Tees estuary. It was in length 12 inches; the upper parts were mottled with dark brown, and a band of a sooty shade was at the tip of the tail; the tail was very slightly forked; the primaries were black on both webs next the shafts and white on the remainder of the inner webs; the under wing was white, the bill was blackish, and the feet were yellowish-pink.—T. ASHTON LOFTHOUSE, Linthorpe, Middlesbrough, 15th November 1900.

Attack by Missel-Thrush on Young Rook.—On the 1st of May this year, whilst chasing a young Rook (*Corvus frugilegus*), fallen from its nest, I saw it hiding near a tree in which a Missel-Thrush (*Turdus viscivorus*) had its nest with three young ones in, and at once the old hen got off the nest, darted down on the Rook, and knocked it over with its wing. I stopped to watch them, and she did not leave until the Rook was driven quite fifty yards away. The Missel-Thrush would rise from the ground, then dart down like a hawk, and each time the Rook was knocked over. I noticed a few days after in 'The Naturalist' that the same thing occurred with a Jackdaw (Miss M. L. Anderson's note, May 1900).—B. R. LUCAS, 3, Dyer Terrace, Winnington, Northwich, 2nd November 1900.

Crossbills near Twigmoor, Lincolnshire.—When out on a ramble on the 11th October I passed the Twigmoor and Scawby Wood. On the Twigmoor side of the road are a few Scotch fir and spruce trees. Here I saw a small flock of Crossbills (*Loxia curvirostra* L.) feeding. They were busy dismembering the cones. I counted nine birds, but, from the cries uttered from time to time I gathered that more were feeding further inside the wood.

The late Mr. Cordeaux was of opinion that it bred within the bounds of the county. In his list of 'British Birds Belonging the Humber District,' 1899, p. 11, he writes thus:—'Probably resident and nesting, as it is found in certain localities through the year where conifers flourish.'

It has become much commoner of late; we used to count it a rare visitor some years ago, but now we meet with it nearly every autumn and winter.—MAX PEACOCK, The Manor, Bottesford, Lincolnshire, 15th Oct. 1900.

Pied Rooks and Blackbird at Kettlebythorpe and at Wooton-Wold, Lincs.—On Friday, 19th of October, my brother (the Vicar of Cadney) and myself went over to Kettlebythorpe (Div. 3). At this place we came across a grass field that shows the remains of earthworks and ponds, also an oblong barrow which is marked on the last Ordnance Survey as 'grave-yard.' When we entered this meadow we put up a large flock of Rooks (*Corvus frugilegus*), but they were very tame and did not take to wing until we were within easy gunshot of them. Three out of the number had white feathers in both wings. All the birds thus marked showed an equal quantity of white. As a rule, when we see an odd white feather or two, we put it down to an injury, but in this case I think the three birds had carried these distinctive marks from the date they cast off the shell.

In the garden of Mr. F. E. Nowell, of Wooton-Wold (Div. 3), may be seen a white cock Blackbird (*Turdus merula*).—MAX E. PEACOCK, Cadney, Brigg, 31st October 1900.

SOME POLYZOA, ETC., OF THE CUMBERLAND COAST.

S. LISTER PETTY,
Ulverston, North Lancashire.

As the following is, I believe, the first list of its kind for Cumberland, its fragmentary state must to some extent be accounted for as a preliminary examination of a somewhat difficult coast line to work. The railways have not been arranged for the convenience of a natural history worker who resides outside the county. While staying at Silloth the rain came down every day and most of the day, and only two small, and by no means select, gatherings were obtained. Weeds were scarce, and none of the material was too clean.

As an example of the difficulty which occasionally presents itself in naming the host species, one clump of *Tubularia indivisa* L. had many of its tubes incrusted by *Membranipora pilosa*; some were covered by growths of *Scrupocellaria reptans*, amongst which was *S. scruposa*, *Bugula flabellata*, and *Sertularella polyzonias*.

My thanks are due to Miss Allen, of Ulverston, for specimens from Bootle, and to Mr. Joseph Parkinson for the Hodbarrow gathering from a mussel ground at a depth of 20 feet at low water. Hodbarrow is near Millom. Specimens have been forwarded to Mr. W. Hodgson, A.L.S., of Workington. A few bits I have mounted for preservation. Names and order as in Dr. Hincks' books.

POLYZOA.

Gemellaria loricata L. Hodbarrow, from mussel bed, 20 feet at low water.

Scrupocellaria scruposa L. Hodbarrow, on *Flustra foliacea* and *Laminaria digitata*; Silecroft, on *Flustra*, *Corallina*, and *Tubularia*; Bootle, on *Corallina*.

Scrupocellaria reptans L. Silecroft, on *Hydrallmania*, *Antennularia*, and *Tubularia*, in quantity; with oœcium (i.e., the ovicell) on *Flustra* and *Corallina*; in quantity on a bleached weed which I cannot name. Bootle, on *Flustra* and *Corallina*.

Bugula flabellata J.V.Thomps. Silecroft, on *Flustra* and *Tubularia*.

Flustra foliacea L. Hodbarrow; Silecroft, common; Bootle; Silloth.

1901 January 2.

Membranipora pilosa L. Hodbarrow, on *Flustra*; Silecroft, common on almost all hydrozoa and weeds, on *Corallina, Tubularia*, etc.; Bootle.

Membranipora dentata. Hodbarrow, on *Fucus vesiculosus* L. and on shell of *Aporrhais pes-pelecani* L.; Silecroft, on shell of *Buccinum undatum*, and completely covering some of the weeds, polyzoa and hydroids; Silloth, on *Hydrallmania, Obelia geniculata*, and *Sertularia cupressina.*

Membranipora membranacea L. Silecroft, on *Fucus vesiculosus, Laminaria, Hydrallmania*; with 'tower cells' of Nitsche on *Laminaria digitata*, gathered in August; Bootle, on *Fucus*; Silloth,

Lepralia species; on a bleached weed at Silecroft, but I cannot name it in its present condition—perhaps too young; the same at Silloth on *Hydrallmania.*

Crisia eburnea L. Hodbarrow, on *Flustra*; Silecroft, on *Flustra*; *Sertularia abietina, Scrupocellaria reptans,* and on a young bivalve shell; Bootle and Silloth, on *Hydrallmania.* No varieties seen.

Idmonea serpens L. Bootle, on *Sertularia abietina.*

Amathia lendigera L. Hodbarrow, on *Obelia*; Silecroft, on *Flustra, Sertularia argentea,* and occasionally loose pieces intermixed in other species; Silloth, on *Hydrallmania,* etc.

HYDROZOA.

Tubularia indivisa L. Silecroft, in quantity.

Obelia geniculata L. Hodbarrow, a few bits; Silecroft, on *Flustra* and *Fucus vesiculosus.*

Obelia dichtoma L. What appears to be this, but in bad condition, from Hodbarrow, on mussel shells; Silloth, mixed amongst other species.

[***Campanularia verticellata*** L. Near Whitehaven, Dr. W. Brownrigg, F.R.S., in Ellis' 'Corallines,' 1755, p. 23.]

Filillum serpens Hassal. Silecroft, on *Sertularia abietina.*

Sertularella polyzonias L. Silecroft, on *Tubularia indivisa.*

Sertularella rugosa L. Hodbarrow, on a fragment of *Scrupocellaria scruposa*; Silecroft, a small piece on a dead and dry weed; Bootle, on *Flustra foliacea,* and a bit loose in *Corallina.*

Daphasia attenuata Hincks. Silecroft, on *Sertularia operculata*; Silloth.

Sertularia pumila L. Silecroft, with capsules, on *Laminaria*; on *Fucus vesiculosus*; Bootle, on *Hydrallmania.*

Sertularia operculata L. Silecroft, a piece about three inches long.

Sertularia filicula E.&S. Silloth.

Sertularia abietina L. Hodbarrow, a good piece loose, and at Silecroft and Bootle. This species often—and others also—heavily covered by the shell *Spirorbis serpuloides.*

Sertularia cupressina L. Silloth, with capsules, a piece about 7½ inches long.

Sertularia argentea E.&S. Silecroft, on shell of ? *Astarte,* and on other hydroids, and one good piece alone; Silloth.

Hydrallmania falcata L. Hodbarrow, on mussel shells; Silecroft, on ? *Astarte,* and common; Bootle, loose pieces; Silloth, common.

Antennularia antennina L. Silecroft, some broken pieces, one covered by a sponge—first-named at foot of this.

Corallina officinalis L. Common from mussel shells at Hodbarrow and Silloth shore.

SPONGES.

Spongelia fragilis Schmidt. Silecroft, another specimen, and one named above.

Chalina oculata Bk. Silecroft, several specimens.

I did not find the Spiny Cockle (*Cardium aculeatum*?) so plentifully at Silecroft as when last there in 1887. Amongst the valves of this a small battered specimen of an *Echinus* was found, still bearing a few spines much bleached.

I shall be glad to receive specimens from any Cumberland coast station not in this list, and will name and return them if their state will allow, on the condition that their names are afterwards printed in this journal.

NOTE—POLYZOA AND MARINE ALGÆ.

Polyzoa and Marine Algæ from Scarborough Neighbourhood.—Mr. A. J. Parke, of the Malton Naturalists' Society, has lent me a small collection of Seaweeds, gathered in the neighbourhood of Scarborough. As most of them are catalogued in Mr. Massee's list in 'The Naturalist,' and as some possibly require confirmation of names, only those bearing Polyzoa are given below, with one exception.

Scrupocellaria scruposa L. On ? *Rytiphlœa fruticulosa* Harv.

Membranipora pilosa L. On ? *Sphærococcus coronopifolius* Ag.

Membranipora dentata. On ? *Rytiphlœa fruticulosa* Harv., *Maugeria sanguinea* S.O.Gray, *Callophyllis laciniata* Kütz., and *Schizymenia edulis* Stackh.

Crisia eburnea L. On ? *Rytiphlœa fruticulosa* Harv.

What appears to be a *Lepralia,* but not in a condition to name, possibly too young, on *Callophyllis laciniata* Kütz. and *Gigartina mamillosa* Ag.

Sertularia operculata L. On *Ahnfeltia plicata* Fries.

One omission in Mr. Massee's list is supplied by Mr. Parke's *Corallina squamata* Parkinson.—S. L. Petty, Ulverston, 22nd November 1900.

NOTES—LEPIDOPTERA.

***Xanthia aurago* and *Euperia fulvago* in the Huddersfield District.**—Mr. B. Morley reports two very interesting additions to our local list of lepidoptera, in *Xanthia aurago* and *Euperia fulvago*; several of the former in a beech wood, and two of the latter in Deffer Wood, all near Skelmanthorpe, during the past season.—GEO. T. PORRITT, Crosland Hall, near Huddersfield, 26th November 1900.

***Psyche opacella*, a Lepidopteron new to Yorkshire.**—Recently Mr. George Rose brought me for examination a large *Psyche* 'case' which he found some weeks ago in the trunk of a tree in the wood near Dunford Bridge Railway Station, and which proves to be *Psyche opacella*, a species quite new to the county of York. It is a very interesting insect, and formed the subject of a paper read by Dr. T. A. Chapman before the Entomological Society of London, on 6th June last, and which paper, together with a plate illustrating the species, appears in the part recently issued (October 1900) of the Transactions of that society.—G. T. PORRITT, Crosland Hall, near Huddersfield, 26th November 1900.

BOOK NOTICE.

The Victoria History of the Counties of England Entomology.—This history is, as our readers probably know, intended to deal in an exhaustive manner, with each county of England separately; and the first county to appear is Hampshire. We have received the Entomological portion, and from it are able to judge somewhat as to the way in which this new and immense work is to be published. It is clear at once that it is to be done under careful editorship, in good style, on large thick paper, and with excellent type. The Entomology is edited by Mr. Herbert Goss, well-known as for many years Secretary to the Entomological Society of London, and we heartily congratulate Mr. Goss on the result of his work; and no less so the Publishers (Messrs. A. Constable & Co.) on securing so able an editor. If the lepidoptera of each county could be done as well as this, we should have, when the 'Victoria History' is completed, a complete set of county lists by competent authorities. But it is just here where we see there may be future danger. There are many counties where we fear it will be impossible to find sufficiently competent persons to do the work satisfactorily; and, if not, we have no hesitation in saying that it will be far better to leave out lists for such counties altogether than risk the publication of inaccurate and misleading ones. To return to the part before us, Mr. Goss has not only done his own part of the work exceedingly well, but has fortunately also been able to secure the co-operation of some of the best specialists in his own and most of the other branches of Entomology. As might have been expected in the county which contains perhaps the best known and most universally worked locality in Britain—the New Forest—the lists of Lepidoptera and Coleoptera are especially interesting and full; and probably many years will elapse before that of the Lepidoptera, at any rate, is materially added to. The Macro-Lepidoptera have been 'done' by Mr. Goss, assisted by Mr. W. H. B. Fletcher and Captain Savile-Reid; whilst Messrs. P. B. Bright, Eustace R. Bankes, C. G. Barrett, and W. H. B. Fletcher are responsible for the Micros. The Coleoptera are fully worked out by the Rev. Canon W. Fowler and Mr. James J. Walker; Neuroptera and Trichoptera by Messrs. R. M. Lachlan, K. J. Morton, and J. J. F. X. King; the Orthoptera by Mr. Malcolm Burr; Aculeate Hymenoptera by Mr. Edward Saunders; the Phytophaga by Miss Ethel Chawner; the Diptera by Mr. F. C. Adams; the Hemiptera-Heteroptera by Mr. Edward Saunders; and the Hemiptera-Homoptera by Mr. James Edwards. The lists of some of the so-called 'neglected orders' are necessarily incomplete, but the names of the compilers are in themselves guarantees of their correctness so far as they go, and thus they form solid bases upon which future workers may safely build. We hail the appearance of the volume with the greatest satisfaction, and eagerly look forward to seeing those devoted to other counties equally well done.—G. T. P.

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Papers and records published with respect to the Natural History and Physical Features of the North of England.

GEOLOGY AND PALÆONTOLOGY, 1897.

THE present instalment has been compiled and edited by

THOMAS SHEPPARD, F.G.S.

Previous instalments of the Bibliography of Geology and Palæontology have appeared as follows:—

For 1884,	in 'Naturalist,'	Dec. 1885, pp. 394-406.
,, 1885,	,,	Nov. 1886, pp. 349-362.
,, 1886,	,,	June 1888, pp. 178-188.
,, 1887,	,,	Feb. 1889, pp. 61-77.
,, 1888,	,,	April-May 1890, pp. 121-138.
,, 1889,	,,	Nov. 1890, pp. 339-350.
,, 1890,	,,	Oct.-Nov. 1891, pp. 313-330.
,, 1891,	,,	July-Aug. 1892, pp. 219-234.
,, 1892,	,,	Sept. 1893, pp. 265-279.
,, 1893,	,,	Sept.-Oct. 1898, pp. 273-296.
,, 1894,	,,	March-April 1899, pp. 81-103.
,, 1895,	,,	Oct.-Nov. 1899, pp. 305-324.
,, 1896,	,,	June 1900, pp. 173-191.

I have to thank Mr. W. Denison Roebuck, F.L.S., and Mr. Alfred Harker, M.A., F.G.S., for assistance.

Particulars of papers, etc., omitted from the following list will be gladly received and included at the commencement of the 1898 Bibliography. Every effort will be made, however, to ensure these lists being as complete as possible.

The lists for 1898-1900 will be published as soon as possible, and it would render them more complete if editors of periodicals, secretaries of societies, and especially authors of papers in local journals, etc., would send copies to the editor of this journal at 259, Hyde Park Road, Leeds. Reprints and authors' separate copies should bear the name of the publication, the number of the volume or part, the *original* paging and the *actual* date of publication.

As regards dating, we would suggest to Editors and Secretaries that care be taken to give the actual date of publication on the wrapper of all parts of journals and transactions; there is often difficulty and uncertainty, and we might instance some

Transactions as not even stating the *year* of publication of the various parts. Bibliographers would greatly appreciate attention to this point.

The Watsonian vice-counties are adopted throughout these bibliographies as more convenient and uniform in extent than the political counties; those comprised within the North of England are the following:—

53, Lincoln S.; 54, Lincoln N.; 56, Notts.; 57, Derby; 58, Cheshire; 59, Lancashire S.; 60, Lancashire W.; 61, York S.E.; 62, York N.E.; 63, York S.W.; 64, York Mid W.; 65, York N.W.; 66, Durham; 67, Northumberland S.; 68, Cheviotland; 69, Westmorland with Furness and Cartmel; 70, Cumberland; and 71, Isle of Man; with their adjoining seas.

The use of the phrases 'Northern Counties,' 'Lake District,' 'Yorkshire,' etc., implies that the references are vague, or general in their application; the phrase 'All the Northern Counties' implies that every vice-county is represented by definite mention; in all other cases the vice-counties referred to are named.

1897.

ANON. [not signed]. LANC. S.

Discovery of a Bog Oak. "Ten Thousand Years Old." Forty tons in weight [unearthed during construction of new sewage works at Manchester]. Daily News, 31st December 1897.

ANON. [not signed]. DERBYSHIRE.

The Derbyshire Coalfield. Coll. Guard., Vol. 74, 1897, pp. 510-511, 571.

ANON. [not signed]. NORTHERN COUNTIES.

Home Office. | Mines and Quarries. Mineral Statistics | of the | United Kingdom of Great Britain | and Ireland, | with the Isle of Man, | for the year 1896. | . . | . . | . . | . . | London | . . | 1897.

ANON. [not signed]. NORTHERN COUNTIES.

Prehistoric Man and Beast. By the Rev. H. N. Hutchinson. 1896. [Review, referring to the drift and cave-deposits of the North of England, etc.]. Geol. Mag., 1897, pp. 77-80.

ANON. [not signed]. YORK S.E.

Presents to the Museum [of the Hull Lit. and Phil. Soc.; includes 'large collection of local fossils' by 'His Honour Judge Bedwell']. Ann. Report and Trans. Hull Lit. and Phil. Soc., 1896-7, pub. 1897, p. 10.

ANON. [not signed]. YORK S.E. AND MID W.

Reports of Field Excursions [during 1895: Coast between Hornsea and Aldborough, 15th April, details of a cliff section given and boulders, etc., noticed; York, 26th and 27th April, when the famous York moraines were traversed; Leeds Museum on 16th May; Burdale and Acklam Brow, 3rd June, chalk and oolitic beds, and ancient British entrenchments and tumuli; Gristhorpe and Filey on 27th and 28th June, and Flamborough on the 29th, oolitic and chalk rocks visited and list of fossils from the Brigg at Filey given; Beverley, Walkington, and Little Weighton on 5th August, with details of section in the chalk at Beverley; and Ryehill and Burst-

wick on 17th September, to examine sections in the Holderness moraine, with lists of shells from the gravel]. Trans. Hull Geol. Soc., Vol. 3, 1895-6, publ. 1897, pp. 9-15.

ANON. [not signed]. YORK MID W. AND S.W.

Yorkshire Coalfield. Colliery Guardian, Vol. 73, 1897, pp. 64, 65, 112, 157, 158, 205, 252, 299-301, 348, 349, 394, 395, 439, 440, 487, 488, 535, 536, 585, 586, 625, 671, 672; Vol. 74, pp. 873-875.

ANON. [query, P. F. Kendall, Editor]. NORTHERN COUNTIES.

Annual Report of the Geological Survey of the United Kingdom for the year ending 31st December 1896. By Sir Archibald Geikie, D.C.L., F.R.S., Director-General [the section devoted to Pleistocene and Glacial reviewed and summarised]. Glac. Mag., Sept. 1897, pp. 66-85.

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J. BARNES AND W. F. HOLROYD. DERBYSHIRE.

On the Occurrence of a Sea-Beach at Castleton, Derbyshire, of Carboniferous Limestone Age [in the uppermost beds of carboniferous limestone between Peak Castle and Speedwell Mine; the conglomeratic appearance of the bed, and its contained fossils, point to its having been deposited in shallow water; a discussion by various gentlemen is also printed, and numerous sections and diagrams illustrate the paper]. Trans. Manch. Geol. Soc., Vol. 25, Parts 4 and 5, 1897, pp. 114-132.

J. BARNES AND W. F. HOLROYD. DERBYSHIRE.

Further Notes on the Sea-Beach in Carboniferous Limestone, Derbyshire [bringing further evidence in support of the conclusion arrived at in the previous paper, viz., that the deposits around the districts mentioned were made in a shallow sea, with adjacent land areas]. Trans. Manch. Geol. Soc., Vol. 25, Part 7, pp. 181-184 and plate.

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S. Bateman. Linc. N. and S.

The Story of the Lincoln Gap [remarks on F. M. Burton's Presidential Address to the Lincolnshire Naturalists' Union]. Linc. Notes and Queries, July 1897, pp. 110-112.

L. L. Belinfante. All the Northern Counties.

Index to Volumes 1-50 [1845-1894] of the Quarterly Journal of the Geological Society. Parts 1 and 2, A-Z. Quart. Journ. Geol. Soc., Nos. 200a and b, 1897, pp. 1-427.

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Further Remarks on the Durham and Cleveland Salt Districts [giving details of two borings; one at Haverton Hill, 2,173 ft., and one near Seaton Carew, 1,814 ft.; which are described with reference to their bearing on the geology of the district; a lengthy discussion by various gentlemen also printed]. Trans. Manch. Geol. Soc., Vol. 25, Part 3, pp. 69-83.

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The Geology of North-east Lancashire. Colliery Guardian, Vol. 74, 1897, p. 212.

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Naturalist,

that the Holderness coast has been denuded at the rate of a little over 7 ft. per annum since the time of the Doomsday survey in the eleventh century]. Trans. Hull Geol. Soc., Vol. 3, 1895-6, publ. 1897, pp. 16-17.

B. A. BURRELL. YORK MID W.

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Erratic Boulders in Lincolnshire [points out that several boulders used as 'corner-stones,' etc., have been transported by artificial means]. Naturalist, Dec. 1897, pp. 371-372.

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W. LOWER CARTER. NORTHERN COUNTIES.

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W. LOWER CARTER. YORK S.W.

[Boulders at] Battyeford [in The Yorkshire Boulder Committee and its Tenth Year's Work]. Naturalist, March 1897, p. 67.

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W. CASH. YORK S.W.

"The Flora of the Halifax Hard Bed" [abstract; briefly describing the various plants met with in the Halifax Hard Bed and comparing them with those found in other districts]. Trans. Leeds Geol. Assn., Part 10, 1894-6, pp. 43-44.

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Lincolnshire Boulders [at Goxhill, Ranby, etc.]. Naturalist, April 1897, pp. 103-105.

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Notes on the Glacial Deposits of Cleethorpes and District [giving particulars of sections exposed in brick-pits, etc., and of the boulders found]. Naturalist, Sept. 1897, pp. 277-281.

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On a New Section in the Middle Lias of Lincoln [describing the beds exposed in Handley's Pit, Lincoln; and recording the presence in the section of the 'Marlstone Rock bed,' formerly thought to be absent; lists of fossils given]. Geol. Mag., 1897, pp. 253-259.

J. H. Cooke. Linc. S.

Middle Lias Reptile from Lincoln [a curved Enaliosaurian tooth, 13 inches in length]. Naturalist, Jan. 1897, p. 20.

H. H. Corbett and Percy F. Kendall. York S.W.

[Boulders at] Balby [in the Yorkshire Boulder Committee and its Tenth Year's Work]. Naturalist, March 1897, pp. 68-69.

John Cordeaux. Yorkshire, Lincolnshire.

President's Address to the Yorkshire Naturalists' Union: Delivered at Leeds, November 26th, 1896 [briefly refers to geology]. Naturalist, July 1897, pp. 193-208.

M. Cossman. York N.E., etc.

Revue Critique de Paleozoologie, No. 4, Oct. 1897 [reviewing 'The Fauna of the Keisley Limestone, Parts 1 and 2,' by F. R. Cowper Reed (pp. 132-133); A Monograph of *Carbonicola, Anthracomya,* and *Naiadites,* Part 3,' by Wheelton Hind; 'A Monograph of British Carboniferous Lamellibranchiata,' by Wheelton Hind; and 'Description of Two New Species of Gasteropoda from the Upper Lias of Yorkshire,' by Rev. J. Hawell; considers that the *Actæonina kendallii,* described by the Rev. J. Hawell, may belong to his (Cossman's) sub-genus *Ovactæonina*; and that *Turbo saltviciensis* is not a true *Turbo,* though it is not stated to what genus the fossil belongs]. Paris, 1897.

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Geology of Deepcar and its Surrounding Hills. Trans. Fed. Inst. Min. Eng., Vol. 13, pp. 341-347 [Map, 1 inch = 1,466 ft.], 1897; and Proc. Midl. Inst. Min. Eng., Vol. 14, pp. 453-458, 1897, with map.

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W. H. Crofts. York S.E.

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Cumberland, Westmorland.

J. R. Dakyns, R. H. Tiddeman, and J. G. Goodchild.

The Geology of the Country between Appleby, Ullswater, and Haweswater [with general and detailed descriptions of the Skiddaw Slates and the Borrowdale Volcanic Series, the Coniston Limestone, Graptolitic Mudstones, Stockdale Shales, and Coniston Flags; also of the Carboniferous and Red Rocks of the Vale of Eden and bordering country, and the Glacial and Post-Glacial deposits of the area surveyed]. Mem. Geol. Surv. England and Wales, Expl. of Quarter-sheet 102 S.W. (New Ser. Sheet 30), 1897, pp. vi. + 110.

Paul Davis and J. W. Stather. York N.E.

[Boulders at] Redcar and Saltburn [etc., in the Yorkshire Boulder Committee and its Tenth Year's Work]. Naturalist, March 1897, p. 73; and Trans. Hull Geol. Soc., Vol. 3, 1895-6, publ. 1897, p. 7.

C. E. DeRance. Lanc. S., Nottingham, Cheshire, etc.

On the Permo-Carboniferous Boundary [after describing and correlating various sections in some detail, concludes:—'The contemporary erosion and current bedding which characterise the Permians of Lancashire and Cheshire are present in the overlying Bunter and Lower Keuper Sandstones, but the erosion sustained over Worcestershire, Shropshire, Staffordshire, Cheshire, Derbyshire, and Lancashire is far less extensive than that that previously took place, but there is no break in continuity of physical conditions between the Permian and the Bunter, or indeed between the Permian and the top of the Lower Keuper Sandstone, "f 4" of the Geological Survey, the break and entire change of method of deposition taking place at the base of the Keuper Waterstones, "f 5" of the Geological Survey, above which no physical break occurs either at the base of the Keuper Marls, that of the Rhætic, or that of the Lias, in Cheshire and Shropshire; discussion also printed]. Trans. Manch. Geol. Soc., Vol. 25, Pt. 8, pp. 207-235, and Coll. Guard., Vol. 74, pp. 603-605, 1897.

C. E. DeRance. Cheshire.

Vertical Sections of the Cheshire Salt and Brine Shafts and Borings. Geol. Surv. Eng. and Wales, Vert. Sects., sheet 82, 1897.

G. Dunston. Notts.

The Eastern Extension of the Midland Coalfield, and Exploration at Southsea. Trans. Fed. Inst. Min. Eng., Vol. 12, 1897, pp. 515-522.

[Miss] G. L. Elles. Lake District.

The Subgenera *Petalograptus* and *Cephalograptus* [several Lake District specimens figured and described]. Quart. Journ. Geol. Soc., Vol. 53, May 1897, pp. 186-212, and plates 13 and 14.

Arthur H. Foord. 'Lincoln.'

On a New Genus and Species of Nautilus-like Shell (*Acanthonautilus bispinosus*) from the Carboniferous Limestone of Ireland [noting that the

thickened rim of the umbilicus of this fossil resembles only one other nautiloid shell, viz., *Nautilus terebratus*, from the Upper Lias of Lincoln]. Geol. Mag., 1897, pp. 147-150.

ARTHUR H. FOORD AND GEORGE C. CRICK. NORTH OF ENGLAND.

Catalogue of the Cephalopoda in the British Museum (Natural History). Part III., containing the Bactritidæ and a part of the suborder Ammonoidea. 8vo., pp. xxxiv.+304. London: Dulau, 1897. Reviewed in Geol. Mag., 1897, pp. 280-5.

C. LE NEVE FOSTER. ALL THE NORTHERN COUNTIES.

Home Office. | Mines and Quarries. | Third Annual General Report | upon the | Mineral Industry | of the | United Kingdom of Great Britain and Ireland, | for the Year 1896. | By C. Le Neve Foster, D.Sc., F.R.S., | . . | . . | London | . . 1897.

H. G. FOSTER-BARHAM. WESTMORLAND, CUMBERLAND, ETC.

Field Geology in South Westmorland [with maps of Lake District and of distribution of Shap Granite boulders, by J. G. Goodchild]. 8vo., 20 pp. and plate. Kendal, 1897.

C. FOX-STRANGWAYS. See Strangways, C. Fox.

R. L. GALLOWAY. CHEVIOTLAND, NORTHUMBERLAND, DURHAM.

Annals of Coalmining and the Coal Trade. Coll. Guard., Vol. 73, pp. 15, etc. [map Northumberland and Durham, 1 inch = 14 miles]. 1897.

C. I. GARDINER AND S. H. REYNOLDS. ISLE OF MAN, WESTMORLAND.

An account of the Portraine Inlier (co. Dublin) [pointing out (p. 535) that 'there seem to be many points of resemblance between the Portraine and the Isle of Man [Crush-] conglomerates;' also refers to the Keisley Limestone]. Quart. Journ. Geol. Soc., Vol. 53, Dec. 1897, pp. 520-539; abstract in Geol. Mag., 1897, pp. 334-5.

E. J. GARWOOD [Secretary]. YORK MID W., NORTHUMBERLAND.

Life-Zones in the British Carboniferous Rocks. Report of the committee . . . appointed to study the Life-Zones in the British Carboniferous Rocks [refers to the work being done on the fauna of the Millstone Grit at Eccup, near Leeds, where a very fossiliferous marine band has been discovered by P. F. Kendall]. Geol. Mag., 1897, pp. 556-7, and Brit. Assn. Report, 1897, pp. 296-297.

LAKE DISTRICT, CHEVIOTLAND,
ARCHIBALD GEIKIE. DERBYSHIRE, ISLE OF MAN, ETC.

The Ancient Volcanoes of Great Britain [noting especially the accounts of volcanic phenomena in the Arenig—Bala of the Lake District (i., pp. 227-238), the Lower Old Red Sandstone of the Cheviots (275, 336-338), and the Carboniferous of Derbyshire and the Isle of Man (ii., pp. 8-32), besides notices of the Great Whin Sill (2-8), and the north country dykes of Carboniferous (1, 2) and of Tertiary age (106, 112, 113, 121)]. Two vols. large 8vo., pp. xxiv.+477, viii.+492, with 7 maps; London, 1897.

ARCHIBALD GEIKIE. ISLE OF MAN.

Annual Report of the Geological Survey . . . for . . . 1896 [giving further information concerning the Skiddaw Slates of the Isle of Man, their subdivisions, succession, and metamorphism, and the granites of Foxdale and Oatlands; noting also the discovery of Triassic and Permian strata in borings in the north of the island; and giving an important general account of the glaciation of the island]. 107 pp. and 4 maps; Appendix to 44th Rep. Dept. Sci. and Art, 1897.

GEOLOGICAL SURVEY OF ENGLAND AND WALES. LANC. S. AND W.

Geological Map of Lancashire (6 inches to a mile). Sheets 106, 113, new editions.

CHEVIOTLAND, NORTHUMBERLAND, GEOLOGICAL SURVEY OF ENGLAND AND WALES. ISLE OF MAN.

General Geological Map of England and Wales (4 miles to an inch), Chromo-lithographed edition, sheets 1 (Title), 2 (Northumberland), 3 (Index of Colours), and 4 (Isle of Man).

J. G. GOODCHILD. YORKSHIRE, NORTHUMBERLAND.

An Outline of the Geological History of the Rocks around Edinburgh [accompanied by Comparative Sections of Lower Carboniferous Rocks. A, Edinburgh; B, Northumberland; C, Yorkshire]. Proc. Geol. Assn., August 1897, pp. 117-143.

J. G. GOODCHILD. CUMBERLAND.

Desert Conditions in Britain. An Address to the Geological Society of Edinburgh, at their Opening Meeting on the 19th November 1896 [briefly refers to the Whitehaven sandstone, the Brockram of the Vale of Eden, etc.]. Trans. Edinburgh Geol. Soc., 1897, pp. 203-222.

J. G. GOODCHILD. See 'J. R. Dakyns.'

FRED. J. GRAY. ISLE OF MAN.

The Rocks of the Isle of Man [describing various beds exposed at Groudale, Laxey, Port Soderick, and Peel, with petrological notes]. Science Gossip, Dec. 1897, pp. 199-203.

W. S. GRESLEY. DERBYSHIRE.

Remarks on Some Interesting Coal Measure Sections in the Leicestershire and South Derbyshire Coalfield [describing and figuring numerous interesting sections in the coal and 'fire-clay' series, some of which show curious faults and contortions]. Trans. Manch. Geol. Soc., Vol. 25, Part 3, 1897, pp. 95-105.

C. GRIFFIN, ETC. ALL THE NORTHERN COUNTIES.

Year-book of Scientific and Learned Societies of Great Britain and Ireland: comprising Lists of the Papers read during 1896, pp. iv. + 270, 1897.

W. GUNN. CHEVIOTLAND.

The Geology of the Country between Norham and Tweedmouth in Northumberland [describing in detail the divisions of the Carboniferous system, the faulting of the district, and the Glacial and Post-Glacial deposits, with (as appendices) a list of fossils and a bibliography]. Mem. Geol. Surv. Engl. and Wales, Expl. of Quarter-sheet 110 N.W., N.S. Sheet 1, pp. ii. + 20, 1897.

—. HALL. LANC. S.

Boring for Coal at Bold, near St. Helens [the core of which, 550 yards long, is preserved in Bold Hall; a visit suggested]. Trans. Manch. Geol. Soc., Vol. 25, Part 3, 1897, p. 112.

C. D. HARDCASTLE. YORKSHIRE.

In Memoriam. Thomas Tate, F.G.S. [refers to his geological work in Yorkshire, etc.]. Naturalist, Dec. 1897, pp. 367-370, and portrait.

ALFRED HARKER. NORTHERN COUNTIES.

. . . . | **Petrology for Students: | An Introduction to the Study** of Rocks | under the Microscope. | By | Alfred Harker, M.A., F.G.S., | . . . | . . . | . . . | Cambridge | . . . | 1897 | . . . . | Second Edition, pp. viii. + 334 [see Bibliography for 1895, in Naturalist, Oct. 1899, p. 315].

A. H[ARKER]. YORKSHIRE.

In Memoriam. Alexander Henry Green [refers to his work on the Yorkshire Coalfield, etc.]. Naturalist, April 1897, pp. 111-114, and portrait.

W. Jerome Harrison. Northern Counties.

A Bibliography of Norfolk Glaciology, including the Cromer Cliffs, with the Forest-bed Series [gives titles, summaries, etc., of nearly 500 papers, several of which also refer to the glacial geology of the northern counties]. Glac. Mag., March 1897, pp. 141-185 and plate; June, pp. 1-33, and Sept., pp. 49-62.

W. Jerome Harrison, jun. 'Lancashire Towns.'

An Occurrence of Prehnite in Wales [the 'setts' used for paving in the large Lancashire towns are from the quarries at Pwllheli in Caernarvonshire, in the segretation veins of which occur crystals of quartz, calcite, a little natrolite, brookite, and prehnite]. Min. Mag., Vol. 11, No. 52, May 1897, p. 198.

York N.E., Northumberland, Cumberland,
Walter Noel Hartley and Hugh Ramage. Derbyshire.

The Wide Dissemination of some of the Rarer Elements, and the Mode of their Association in Common Ores and Minerals [silver and nickel found in small amount in Cleveland iron-ore from Middlesbrough; rubidium and silver in Grosmont ironstone, near Whitby; silver, nickel, and strontium in clay-ironstone from Hedley, Northumberland; nickel in ironstone of Normandy Mine, Yorkshire; and lead, gallium, and chromium in all these four ores; Cleator Moor hæmatite found to be remarkably pure; blende from Alston Moor contains considerable amounts of indium, thallium, and gallium, besides cadmium; cadmium and thallium found in blende from Matlock]. Journ. Chem. Soc., Vol. 71, 1897, pp. 533-547.

W. N. Hartley and H. Ramage. York N.E.

On the Occurrence of Gallium in the Clay-ironstone of the Cleveland District of Yorkshire. Proc. Roy. Soc., Vol. 60, 1897, pp. 393-407.

John Hawell. York N.E.

Description of two new species of Gasteropoda from the Upper Lias of Yorkshire [*Actæonina kendallii* and *Turbo saltviciensis* found by Mrs. P. F. Kendall in the *Ammonites serpentinus* zone at Saltwick Nab, near Whitby]. Proc. Yorks. Geol. and Polyt. Soc., Vol. 13, Part 2, 1897, pp. 199-200, and plate.

E. Hawkesworth. York N.E.

[Boulders at] Saltburn [in the Yorkshire Boulder Committee and its Tenth Year's Work]. Naturalist, Feb. 1897, pp. 61-63.

W. Hemingway. York S.W.

[Boulders at] Dearne Valley [in the Yorkshire Boulder Committee and its Tenth Year's Work]. Naturalist, March 1897, p. 67.

Northumb., Westm., Lanc. S., York Mid W., S.W.,
Wheelton Hind. Cheshire, Derbyshire.

A Monograph of the British Carboniferous Lamellibranchiata [describing and figuring species from Redesdale, Kendal, Rochdale, etc., Bolland, Settle, and Hill Bolton, Congleton Edge, Bacup, Castleton, and Dovedale, etc.; the new species include *Posidoniella pyriformis, P. gibbosa, P. semisulcata, P. variabilis, P. subquadrata,* and *Myalina redesdalensis*]. Part II., pp. 31-203, Plates 3-15, Palæontograph. Soc., Vol. 51, 1897.

York N.W., Mid W., Lancashire,
Wheelton Hind. Derbyshire, etc.

On the Subdivisions of the Carboniferous Series in Great Britain, and the True Position of the Beds mapped as the Yoredale Series [describing the beds in Wensleydale, Swaledale, Teesdale, Wharfedale, Ribblesdale, etc.]. Geol. Mag., 1897, pp. 91 and 159-169, and 205-213.

W. F. Holroyd. See J. Barnes. Derbyshire.

J. Horne. Northumberland.

Obituary Notice of Hugh Miller ['younger and only surviving son of the illustrious geologist, whose name is a household word wherever the English language is spoken'; reference made to his work in Northumberland, etc.]. Trans. Edinburgh Geol. Soc., 1897, pp. 132-139.

William Horne. York N.E. and S.E.

"The Early Races in Yorkshire" [reviewing the various relics of pre-historic man in the county; particularly in the Northern and Eastern divisions]. Trans. Leeds Geol. Assn., Part 10, 1894-6, publ. 1897, pp. 7-11; also Trans. Hull Geol. Soc., Vol. 3, 1895-6, publ. 1897, p. 15.

J. H. Howarth. York Mid W.

[Boulder of Borrowdale Andesite at] Bowland [in The Yorkshire Boulder Committee and its Tenth Year's Work]. Naturalist, March 1897, p. 67.

B. Holgate. York Mid W.

"A Geological Study in the Horsforth Valley" [(abstract) referring to evidence of glacial action, and also briefly describing the solid rocks exposed]. Trans. Leeds Geol. Assn., Part 10, 1894-6, publ. 1897, pp. 49-50.

Henry H. Howorth. Eastern England.

The Geologically Recent Origin of the Surface Contour of Scandinavia and Finland, and its Lessons [describing a possible effect on Eastern England]. Geol. Mag., 1897, pp. 355-361; 397-404.

Henry H. Howorth. North of England.

Water versus Ice as an Explanation of the Surface Beds of Eastern England [holding that an 'inrush of water from the north and north-east' has 'been the real dynamical cause of the effects which have been so persistently attributed to ice,' and that it was 'water and not ice which laid down the surface beds and gave a final contour to the surface of Eastern England']. Geol. Mag., 1897, pp. 213-225.

Henry H. Howorth. Eastern England.

On the Erratic Boulders and Foreign Stones in the Drift Deposits of Eastern England, and their Lessons [endeavouring to prove that the Land-Ice Theory is insufficient to account for the origin of the drift beds of Eastern England; withdrawing (p. 154) his former contention that the Norwegian boulders of Eastern England were brought to England by the Vikings]. Geol. Mag., 1897, pp. 123-130; and 153-159.

Edward Hull. Eastern Counties.

Sir Henry Howorth on the Glaciation of Norway [letter criticising Howorth's views respecting the former Upheaval of Scandinavia, and its effect upon Eastern England]. Geol. Mag., 1897, pp. 453-457.

E. Hull. Derbyshire.

Notes on Messrs. Barnes and Holroyd's Paper on 'A Raised Beach at Castleton.' Trans. Manch. Geol. Soc., Vol. 25, 1897, pp. 306-307.

W. Fraser Hume. York S.E.

The Cretaceous Strata of County Antrim [briefly comparing (p. 597) the Sponges of the Spongiarian Zone of Antrim with those from the well-known horizon at Dane's Dyke, near Bridlington; and finding there is no sponge common to the two localities]. Quart. Journ. Geol. Soc., Vol. 53, Dec. 1897, pp. 540-606.

T. Rupert Jones. Westmorland.

The Fossil Phyllopoda of the Palæozoic Rocks. Thirteenth Report of the Committee [refers to *Pinnocaris lapworthi* from the Upper Silurian of Westmorland, etc.]. Rep. Brit. Assn., 1897, pp. 343-346.

ALL THE NORTHERN COUNTIES.

T. R. JONES, JUN. [compiler, not signed].

Geological Literature | added to the | Geological Society's Library | during the | year ended December 31st, 1896. | Compiled by | The Assistant-Librarian | . . | and edited by | The Assistant-Secretary | . . | . . | London: | 1897. . . [containing numerous references to papers bearing on the geology of the north of England].

A. JOWETT AND H. MUFF. YORK S.W. AND MID W.

Two Striated Surfaces discovered on Excursions of the Bradford Scientific Association during the summer of 1897 [one at Windhill, Shipley, running N. 18° W., and one between Midgley Wood and Baildon Green, Shipley, the striæ in this case varying from 110° E. of N. to 123° E. of N.]. Glac. Mag., Dec. 1897, p. 124.

J. W. JUDD. NORTH OF ENGLAND.

William Smith's Manuscript Maps [an account of the various maps prepared from time to time by Wm. Smith]. Geol. Mag., 1897, pp. 439-447.

P. Q. KEEGAN. CUMBERLAND.

Stone-cutting in Borrowdale [describing manner in which the volcanic rocks of the Borrowdale series should be selected and prepared for microscope sections]. Sci. Goss., Jan. 1897, pp. 211-212.

LINCS. N., CHESHIRE, DURHAM, NOTTS.,
P. F. KENDALL. YORKSHIRE, ISLE OF MAN.

Erratic Blocks of the British Isles. Second Report of the Committee [includes several Yorkshire and other north country records]. Rep. Brit. Assn., Toronto Meeting, 1897, pp. 349-352.

PERCY F. KENDALL. YORK MID W., N.E., AND S.E.

[Boulders in the] York District [in The Yorkshire Boulder Committee and its Tenth Year's Work]. Naturalist, Mar. 1897, pp. 69-70.

P. F. K[ENDALL]. LANC. S., CHESHIRE.

Lake Basins [referring to G. F. Duncan's paper (Proc. Inst. C. E., Vol. 126) in which some details of the pre-glacial Mersey river bed are given]. Glac. Mag., March 1897, pp. 191-192.

P. F. K[ENDALL]. LINC. N., YORK S.E.

[Note on Mr. Cordeaux's Presidential Address to the Yorkshire Naturalists' Union, in which points of interest to North of England glacialists are brought forward]. Glac. Mag., June 1897, p. 48.

PERCY F. KENDALL. See 'H. H. Corbett.'

P. M. C. KERMODE. ISLE OF MAN.

Occurrences of "Irish Elk" Remains in the Isle of Man [reviewing various records of 'Elk' remains in the Island, and describing results of excavations recently undertaken by a Committee appointed by the British Association]. Glac. Mag., Dec. 1897, pp. 101-112, and plate.

P. M. C. KERMODE. ISLE OF MAN.

Irish Elk Remains. Report of the Committee [referring to many important discoveries in connection with the excavation of the Elk remains, notably remains of the little Arctic crustacean, *Lepidurus glacialis*]. Rep. Brit. Assn. Toronto Meeting, 1897, pp. 346-348.

R. KIDSTON. YORK S.W.

Note on the Occurrence of *Palæoxyris*, Brongniart, in Yorkshire [in the Middle Coal-measures near Barnsley]. Naturalist, Dec. 1897, p. 370.

G. W. Lamplugh. York S.E.

Notes on the White Chalk of Yorkshire. Part III. The Geology of Flamborough Headland, with notes on the Yorkshire Wolds [describing the chalk around Flamborough Headland, views of which are given in twelve excellent photographs by Godfrey Bingley]. Proc. Yorks. Geol. and Polyt. Soc., Vol. 13, Part 2, 1897, pp. 171-191.

G. W. Lamplugh. Isle of Man, York S.E. and N.E.

Shelly Glacial Deposits [in the Isle of Man and on the Yorkshire Coast, discussed in criticism of Bonney]. Nature, 6th May 1897, p. 10.

Joseph Landon. York Mid W.

Underground Water Channels. Instances from the older gravels of the Rea Valley at Saltley [with casual references to the West Yorkshire 'pots']. Journ. of Birmingham N.H. and Phil. Soc., Feb. 1897, pp. 83-86.

R. Law. York S.W.

[Boulders at] Hawks Clough . . . Mytholmroyd, [etc. in The Yorkshire Boulder Committee and its Tenth Year's Work]. Naturalist, Feb. and March 1897, pp. 64-66.

F. Arnold Lees. York S.W. and Mid W.

In Memoriam. Thomas Hick, B.A., B.Sc., A.L.S. [refers to his work amongst the Yorkshire Coal-measure plants]. Naturalist, March 1897, pp. 81-84.

J. H. Lofthouse. York Mid W.

[Boulders at] Harrogate [in The Yorkshire Boulder Committee and its Tenth Year's Work]. Naturalist, March 1897, p. 68.

Joseph Lomas. Lanc. S., Cheshire.

The Earthquake of December 17th, 1896 [felt at Liverpool and neighbourhood; considers that the earthquake was due to waves set up by the slipping of strata somewhere along the Severn valley]. Proc. Liverp. Geol. Soc., 1896-97, publ. 1897, pp. 91-98.

R. Taylor Manson. York N.W., Durham.

Zig-zag | Ramblings | of a Naturalist | By | R. Taylor Manson. | . . | Darlington. | 1897. (Revised edition, Part 1 = pp. 1-56). [Contains numerous geological notes].

R. Taylor Manson. York N.W., Durham.

Notes on the Glacial Striæ at Barton and Fawcett Quarries, at Holwick Head, North Yorkshire, and at Bolam, in South Durham [on the Carboniferous Limestone, covering large areas, the direction of grooving being very constant, from 25° W. of N.]. Glac. Mag., Dec. 1897, pp. 120-123.

R. Taylor Manson. Durham, York N.W.

The Geology of the Tees Valley [describing the glacial gravels and clays so well developed in the neighbourhood; as well as the Lias, Trias, Permian and Carboniferous rocks, and the 'Whin Sill'; outlined for the Darlington and Teesdale Naturalists' Field Club, Session 1896-7]. 9 pp.; Darlington, 1897.

John E. Marr. Westmorland.

***Trinucleus seticornis* and the Upper Bala Beds [letter discussing** points in Mr. Reed's paper on the fauna of the Keisley Limestone]. Geol. Mag., 1897, pp. 378-379.

J. E. Marr. Westmorland.

***Trinucleus seticornis* [reply to Mr. F. R. C. Reed's criticisms in** a former number]. Geol. Mag., 1897, p. 480.

J. E. Marr. Cumberland, Westmorland.

The Origin of Lakes [the author gives reasons for believing that the principal Cumbrian Lakes have been formed by the damming of valleys by drift, etc., only some unimportant tarns occupying true rock-basins]. Science Progress, Vol. 6, 1897 (N.S. Vol. 1), pp. 218-228.

J. W. D. Marshall. York N.E.

Notes on the British Jurassic Brachiopoda. Part II. [giving North-East Yorkshire localities for *Terebratula decipiens* var. *chadwicki* W.&B., *T. repeliniana* D'Orb., *Zeilleria rudleri* W.&B., and *Z. strangwaysi* W.&B.]. Proc. Bristol Nat. Soc., N.S., Vol. 8, Part 2, for 1896-97, dated 1897, pp. 233, 247, and 248.

E. A. Martel. York Mid W. and N.W., Derby, Notts.

Irlande et Cavernes Anglaises. 8vo., pp. 403, pl. III., Paris, 1897.

E. A. Martel. York N.W. and Mid W., Derby, Notts.

British Caves and Speleology. Geogr. Journ., Vol. 10, 1897, pp. 500-511.

Arthur J. Maslen. Yorkshire.

The Rise of Palæontology [briefly refers to Yorkshire geology, etc.]. Sci. Goss., Feb. 1897, pp. 234-236.

L. C. Miall. Yorkshire, etc.

In Memoriam. Professor A. H. Green, M.A., F.R.S., F.G.S. [briefly referring to his work on the Yorkshire Coalfield, etc.]. Proc. Yorks. Geol. and Polyt. Soc., Vol. 13, Part 2, 1897, pp. 232-233, with portrait.

H. A. Miers. Northern Counties.

On Some British Pseudomorphs. Mineralog. Mag., Dec. 1897, Vol. 11, pp. 263-285.

John Milne. York S.E.

Cretaceous Fossils in Aberdeenshire [Report of the Committee; comparing with the fossils from the Speeton Clay]. Rep. Brit. Assn. Toronto Meeting, 1897, pp. 333-342.

David J. Mitchell. York S.E.

The Greensand Fossils from Drift-Beds at Moreseat, Cruden, E. Aberdeenshire, with Exhibition of Specimens collected [compared with the fauna of the Speeton Clay]. Trans. Edinburgh Geol. Soc., 1897, pp. 277-285.

J. R. Mortimer. York N.E.

Killing Pits [on the west brow of Goathland Moor, considering they were probably formed for various reasons at different periods, not solely for any one purpose, certainly not for dwellings]. Proc. Yorks. Geol. and Polyt. Soc., Vol. 13, Part 2, 1897, pp. 144-149.

J. R. Mortimer. York N.E.

On the Origin of some Lines of Small Pits on Allerston and Ebberston Moors, near Scamridge Dykes, in the neighbourhood of Scarborough [rejecting the village theory of these groups of pits]. Proc. Yorks. Geol. and Polyt. Soc., Vol. 13, Part 2, 1897, pp. 150-154.

J. R. Mortimer. York S.E.

Ancient British Star-worship indicated by the Grouping of Barrows [pointing out the resemblances between certain groups of barrows and various constellations, considering that this arrangement of the barrows has been purposely made]. Proc. Yorks. Geol. and Polyt. Soc., Vol. 13, Part 2, 1897, pp. 201-209, and plate.

G. H. Morton. Lanc. S. and Cheshire.

The Geology of the Country around Liverpool, including the North of Flintshire, with Appendix and Geological Map of the District. New Edition [the Appendix includes a Bibliography, a list of fossils from the Permian at Skillaw Clough, and remarks on *Cheirotherium*, etc. (with three plates), on Glacial striæ, the erosion of the Cheshire coast, and recent borings in the Red Marls]. 8vo., pp. 319, and 22 plates; London and Liverpool, 1897. Reviewed in Geol. Mag., 1897, pp. 565-568.

H. Muff. See 'A. Jowett'; and see 'T. Sheppard.'

E. T. Newton and J. J. H. Teall. York S.E.

Notes on a Collection of Rocks and Fossils from Franz Josef Land, made by the Jackson-Harmsworth Expedition during 1894-1896 [several striated and jointed stems of *Phyllotheca* (*Equisetites*) cf. *columnaris* Phil., 'such as we have long known under the name of *Equisetum columnare* in the Yorkshire Beds, occur in these sandy [oolitic] deposits at Cape Stephen" (pp. 503-4, and figured on Plate 41)]. Quart. Journ. Geol. Soc., Vol. 53, Dec. 1897, pp. 477-519.

Jno. Nicholson. York S.E.

[Boulders at] Hornsea [in The Yorkshire Boulder Committee and its Tenth Year's Work]. Naturalist, March 1897, p. 74, and Trans. Hull Geol. Soc., Vol. 3, 1895-6, publ. 1897, pp. 8-9.

A. Noble and N. Nisbet. Northumberland S., Durham.

Notes on Coal-Mining [Broomhill and Tanfield Lea Collieries]. Trans. N. Engl. Inst. Min. Eng., Vol. 46, 1897, pp. 131-136 and plate.

W. S. Parrish. York S.E.

[Boulders at] Swanland [in The Yorkshire Boulder Committee and its Tenth Year's Work]. Naturalist, March 1897, pp. 73-74, and Trans. Hull Geol. Soc., Vol. 3, 1895-6, publ. 1897, pp. 7-8.

G. D. Patterson. Isle of Man.

"A Visit to the Foxdale Mine, Isle of Man" [(Abstract). Situated in the centre of a boss of granite; the different minerals quarried are briefly described]. Trans. Leeds Geol. Assn., Part 10, 1894-6, publ. 1897, pp. 11-12.

E. Adrian Woodruffe-Peacock. Linc. N.

The Lincolnshire Naturalists' Union at Holbeck, Somersby, and Tetford [Geological notes]. Naturalist, Oct. 1897, pp. 317-324.

S. L. Petty. Westmorland and Furness.

Travelled Shap Granite [Boulder noted] on Walney Island. Naturalist, April 1897, p. 105.

John Postlethwaite. Cumberland, Westmorland.

The Geology | of the | English Lake District | with notes on the minerals | by | John Postlethwaite, F.G.S. | Keswick: | . . . 1897 [a useful summary of publications on the subject (though not always including the latest information); also descriptions and figures of new species, chiefly *Lingulas* from the Skiddaw slates; besides the systematic account of the Palæozoic formations, with fossil lists, there is some description of the Glacial phenomena and a list of minerals]. 12mo. pp. iv. + 78 + 22 unnumbered; Keswick; with map.

Hugh Ramage. See 'Walter Noel Hartley.

C. E. De Rance. See 'DeRance.'

T. Mellard Reade. Lanc. S., Cheshire.

The Glacio-Marine Drift of the Vale of Clwyd [compared with the glacial beds of Lancashire and Cheshire]. Quart. Journ. Geol. Soc., Vol. 53, Aug. 1897, pp. 341-348, with map and section.

F. R. Cowper Reed. Westmorland.

The Fauna of the Keisley Limestone. Part II. Conclusion [describing the Ostracoda, Brachiopoda, Mollusca, Echinodermata, and Actinozoa of the Keisley Limestone; and comparing with the species found in the limestone of Kildare, the *Leptæna* Limestone of Sweden, and Stage F. of the East Baltic Provinces]. Quart. Journ. Geol. Soc., Vol. 53, Feb. 1897, pp. 67-106 and plate; abstract in Geol. Mag., 1897, p. 47; reviewed in M. Cossmann's Revue Crit. de Pal., No. 4, Oct. 1897, pp. 132-133.

F. R. Cowper Reed. Westmorland.

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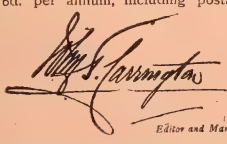

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T. Ward. Lanc. S., Cheshire.

The Rock Salt Deposits of Northwich, Cheshire, and the Results of their Exploitation. Trans. Manch. Geol. Soc., Vol. 25, 1897, pp. 274-298, with map, 1 inch = 11 chains.

Charles Wardingley. Linc. N., Lanc. S.

The Geological History of the Cephalopoda [a general paper, including notes of occurrence of *Goniatites carbonarius*, *G. listeri*, and *Orthoceras* at Wardle and Starring, *Ammonites heterophyllum* (figured) in Upper Lias, South Cliff, Lincoln, Sept. 1895, and *Belemnites vulgaris* in Upper Lias, Lincoln]. Trans. Rochdale Lit. and Sci. Soc., Vol. 5, 1896-97, publ. 1897, pp. 77-78, and two plates.

William Watts. Lanc. S. or York S.W.

Earthquake Tremors [recording being awakened in his residence (near Rochdale?) by an earthquake shock at 5.33 a.m. on 17th December 1896]. Trans. Manch. Geol. Soc., Vol. 25, Part 6, 1897, pp. 164-165.

W. W. Watts. All the Northern Counties.

Photographs of Geological Interest in the United Kingdom. Eighth Report of the Committee [including particulars of several from Yorkshire and other northern counties]. Rep. Brit. Assn., Toronto Meeting, 1897, pp. 298-332.

W. W. Watts. All the Northern Counties.

British Geological Photographs [giving account of the work done by the Geological Photographs Committee of the British Association since its formation in 1889; and urging geologists to further its object by assisting; as examples of the views required, a photo showing a section in the Whin Sill at Cullernose, Northumberland, and of the High Stacks, Flamborough Head, are given]. Geol. Mag., 1897, pp. 31-37, 62, and 109-10.

Wm. Whitaker. York S.W., Mid W., N.E.

Some Yorkshire Well Sections [at Armley, Barnsley, Bradford, Elland, Esholt, Holfield, Keighley, Kirkstall, Leeds, Middlesbrough, and Rotherham; details given]. Proc. Yorks. Geol. and Polyt. Soc., Vol. 13, Part 2, 1897, pp. 192-198.

HENRY WHITEHEAD. YORK S.W.

[Boulder of Borrowdale Volcanic Ash at] Blackstone Edge [in The Yorkshire Boulder Committee and its Tenth Year's Work]. Naturalist, March 1897, p. 66.

ARTHUR SMITH WOODWARD. YORK N.E.

On the Fossil Fishes of the Upper Lias of Whitby. Part II. [describing remains of *Caturus, Saurostomus,* and *Pachycormus*]. Proc. Yorks. Geol. and Polyt. Soc., Vol. 13, Part 2, 1897, pp. 155-170.

H. B. WOODWARD. LINCOLNSHIRE, ETC.

The Chalky Boulder-clay and the Glacial Phenomena of the Western-Midland Counties of England [a very full and clear account of these beds; after carefully examining all the evidence, states, 'If we believe that the main mass of boulder-clay was deposited on the melting back of the ice-sheet, or from the melting of basal portions of the ice, and that there were alternations in the climate, so that the ice extended and receded for some distance more than once before it finally retreated, we can understand the intercalation of water-distributed sands and gravels, as well as laminated muds, with boulder-clay, and more especially along the margin of the glaciated area']. Geol. Mag., 1897, pp. 485-497; Glac. Mag., Sept. 1897, pp. 63-65; and Brit. Assn. Report, 1897, pp. 649-650.

H. B. WOODWARD. CUMBERLAND, CHESHIRE.

Eminent Living Geologists: The Rev. P. B. Brodie, M.A., F.G.S. [referring briefly to Mr. Brodie's work on the Lower Lias of Cheshire and Cumberland]. Geol. Mag., 1897, pp. 481-485.

H. B. W[OODWARD]. LINC. N.

The Rev. John Edward Cross, M.A., F.G.S. [obituary notice; referring to the late Rev. J. E. Cross's work amongst the Jurassic rocks of North-west Lincolnshire]. Geol. Mag., 1897, p. 192.

H. B. W[OODWARD]. LANC. S. AND W., CHESHIRE, WESTMORLAND.

Movements of Beach Sand and Shingle [discussing an article by W. H. Wheeler in the Proc. Inst. Civil Engineers, Vol. 125, 1896, in which Wheeler maintains that the movements are practically confined to the tract between low- and high-water mark, etc.; referring to the sand-bar at the mouth of the Mersey, the enormous sand beds in Morecambe Bay, etc.]. Geol. Mag., 1897, pp. 44-46.

D. WOOLACOTT. DURHAM.

Geology | of | North-east Durham. | A Popular Work | by | D. Woolacott, B.Sc., | etc. | . . | . . | . . | Sunderland: . . | 1897 [divided into chapters as follows:—Introduction; The Geological Series and the Position of the Rocks of this district in it; The General Geological Structure of this district; The Lie of the Coal-Measures; The Coal-Measures—their formation and characteristics; The Aspect of our District during the Carboniferous Period; The Conditions that prevailed after the deposition of the Coal-Measures; The Magnesian Limestone; The 'Cannon-ball' and other structures of the Magnesian Limestone; The Break in the Geological Story of this district; The Great Ice-Age; The Raised Beaches of the District and what they teach; The Submerged Forest in Whitburn Bay; and A Summary of the Geological History of North-East Durham]. 8vo., pp. xii. + 84.

D. WOOLACOTT. DURHAM.

An Explanation of the Claxheugh Section (Co. Durham) [describing a section two miles west of Sunderland, at the base of which are Permian Yellow Sands, succeeded by the Marl Slate, thin-bedded limestones, and at the top crystalline limestones without any trace of bedding, etc.]. Abstract in Geol. Mag., 1897, p. 377; and in Quart. Journ. Geol. Soc., Vol. 54, Feb. 1898, p. 14.

SOME RARER PLANTS OF BOWLAND.

JOSEPH F. PICKARD,
Leeds.

During the years 1893 to 1899 I have been working this district, which is one of the least known in Yorkshire. It lies from Bowland Knotts on the east, to the Trough of Bowland on the west, and the district explored is in the Yorkshire portion of the Hodder valley and neighbouring fells, ceasing at Whitewell, where the river makes a remarkable bend to the south-east.

There still remains much work to be done in this wide district, and I believe a much larger list of its Flora could be made, if time could be spent by some botanists in the little known valleys of Whitendale, Brennand, Hareden, Langden, and Bowland Trough. I hope the Y.N.U. will deem it worth their while before long to arrange for another excursion for a length of at least two days, making their centre, say, Dunsop Bridge.

Most of the plants, all the critical ones, have been seen by Mr. F. Arnold Lees.

Thalictrum flavum. Road-side near the Heaning, and by the Heaning Brook, scarce.

Caltha minor. Two specimens in April 1895, on Crag Stone Moor, behind Stonefold.

Trollius europæus. Frequent in moist meadows and woods on the limestone. I have heard one or two residents at Newton call this plant 'Publicans.'

Meconopsis cambrica. One plant, Dunnow Wood, near the lower path, 1895. Gone since?

Arabis thaliana. Dry, old walls, near Newton Bridge, 1898. Scarce and only occurs where very dry.

Cardamine amara. Frequent in damp plantations near Newton.

Helianthemum vulgare. Dunnow Cliff, flowering sparingly and only found over about an acre of the cliff top.

Viola hirta. Very common on Dunnow Cliff. Occurs also at intervals on banks near the Hodder.

Stellaria nemorum. Frequent in mountainous woods.

Arenaria verna. Very sparingly on rocks of old lead mine, Ashnot Farm, near Storth.

Sagina nodosa. Newton Fell, by the Clitheroe Road, and in most marshy places in the valley.

1901 February 1.

Hypericum humifusum. Marshy banks, road-side near Hareden Hall, and near the Trough of Bowland. Damp meadows near Dalehead.

Euonymus europæus. Sparingly in Dunnow Wood, near the Middle Path.

Rhamnus catharticus. Great Dunnow and Little Dunnow, scarce; but luxuriant shrubs.

Genista tinctoria. Locally called 'Broom.' Frequent in pastures on the limestone.

Cytisus scoparius. Very fine in plantation above Dalehead, the only locality known in the district.

Prunus Padus. Local name 'Heckberry.' Common in woods and hedge-banks.

Rubus saxatilis. Hodder bank below Pinda Ing, Newton-in-Bowland.

***Geum intermedium* (*rivale* × *urbanum*).** Occurs in some plenty in Newton Lane, flowering most years.

Potentilla alpestris. Dunnow Cliff, scarce. First seen in 1896.

Potentilla comarum. Old Hodder, Newton-in-Bowland.

Rosa villosa. A few shrubs, Bentham Road, 1½ miles above Slaidburn.

Saxifraga granulata. Hodder banks near Newton, 1893. Not seen here since, having disappeared probably owing to a land-slip. A few plants by the river near Dalehead, 1895.

Chrysosplenium alternifolium. Rare; Banks Meadow near the Heaning Brook.

Parnassia palustris. Common in bogs.

Ribes alpinum. Storth Wood; one tree, 1895. If not native, probably introduced by birds.

Ribes nigrum. By the Heaning Brook, below Banks Meadow.

Sedum Telephium. Local name 'Livelong.' Abundant on Great Dunnow, more rare on Little Dunnow Cliff.

Lythrum Salicaria. Old Hodder. A few plants in Heaning Bog.

Epilobium angustifolium. Hodder banks above Stocks, and tributary stream banks near Harrop and Lamb Hill.

Myrrhis odorata. Banks of streams, not uncommon.

Galium Mollugo. Not unfrequent in hedge banks, Holgate Hill, Bentham Road, etc.

Scabiosa Columbaria. Great Dunnow Cliff, limestone cliffs above Slaidburn, scarce; more frequent at Little Dunnow.

Eupatorium cannabinum. Frequent by limestone becks and in moist woods.

Gnaphalium uliginosum. Ditch near Staple Oak, Dunsop Bridge, 1896. Not a plant in 1899!

Senecio erucifolius. Hedge, Banks Meadow, near the Heaning.

Senecio saracenicus. Woods, Browsholme.

Carduus heterophyllus. Frequent in meadows and woods, and often very fine.

Wahlenbergia hederacea. Plentiful in Whitendale; more scarce on road-side near Bowland Trough.

Vaccinium Oxycoccos. Frequent on the fells; flowering often, fruiting more rarely.

Vaccinium Vitis-Idæa. Frequent on Newton Fell, where it flowers abundantly; also Whitendale and Brennand Fells.

Andromeda polifolia. Not unfrequent on the fells, Bowland Trough, Bowland Knotts, and moors above Knowlemere Manor.

Erica cinerea. Scarce, and growing very small and stunted, Bowland Trough and Lamb Hill.

Primula farinosa. Local name 'Bird's Eye.' Frequent in moist meadows and bogs on the limestone.

Lysimachia nummularia. Banks Meadow and the Heaning Plantation.

Trientalis europæa. Bradford Fell (Waddington Fell).

Gentiana Amarella. Dunnow Cliff, meadow near Gamble Hole, and near Slaidburn.

Menyanthes trifoliata. The Heaning Bog; bog near Clapham Road, below Bowland Knotts.

Verbascum Thapsus. Dunnow Cliff, where it is frequent.

Mimulus luteus. In great abundance at intervals along the Easington Beck and river Hodder. Established?

Veronica montana. Frequent in the mountainous woods.

Veronica Anagallis-aquatica. Ditches near Newton Bridge and in Old Hodder.

Euphrasia officinalis var. ***gracilis.*** Amongst heather, Smelt Mills, Trough of Bowland.

Melampyrum montanum. Near quarries, Trough of Bowland, 1899.

Stachys ambigua. Hedge-bank, Clapham Road, near Dalehead Church.

Daphne Mezereum. One plant in Dunnow Wood, 1897. Bird-sown?

Populus tremula. A few trees near Holgate Hill, Clitheroe Road.

Epipactis palustris. The Heaning Bog.

Epipactis latifolia. Easington Woods. Plantations, Whingate Farm.

Orchis latifolia. Bog near Bentham Road, on Lamb Hill; bog near Ashnot.

Habenaria viridis. The large pasture above Gamble Hole Farm, 1899.

Narcissus Pseudo-narcissus. Meadow near Thorneyholme. Probably introduced.

Polygonatum officinale. A few plants, hedge-bank near Boarsden Farm, Newton, 1895.

Convallaria majalis. Abundant in Dunnow Wood; more rare in small mountain wood above Stocks, 1898.

Allium oleraceum. A few plants, Newton Lane, July 1899.

Paris quadrifolia. Common in limestone woods. A specimen near the Heaning, 1895, had seven leaves.

Sparganium simplex. Old Hodder, Newton.

Carex glauca. Lamb Hill, Slaidburn, July 1899.

Carex fulva. Whitendale, July 1899.

Carex disticha. Burn Fell and Whitendale, 1899.

Carex pendula. Hodder banks, below Forber Barn, 1899.

Carex sylvatica. Dunnow Wood, near lower path, 1898.

Carex dioica. Plateau moorland between Whitendale and Slaidburn, July 1899.

Brachypodium sylvaticum. Dunsop Lane, near Hund Hill, 1899.

FERNS, ETC.

Cryptogramme crispa. Brennand Fell; Newton Fell.

Asplenium Adiantum-nigrum. One specimen noticed for three years, near Clitheroe Road, above Moorcock Inn.

Ceterach officinarum. Browsholme Hall, on old walls.

Cystopteris fragilis. Dunnow Cliff, Slaidburn, Whitewell, etc. Frequent.

Polystichum lobatum. Dunnow Cliff, Browsholme Woods, etc. Not uncommon.

Polypodium Dryopteris. Dale Head, Storth Woods, Whitendale, Lamb Hill.

Polypodium Phegopteris. Not uncommon in mountain woods, and on open banks.

Ophioglossum vulgatum. Particularly abundant and luxuriant in many pastures and meadows near Newton and Slaidburn, as compared with most districts on the limestone.

Botrychium Lunaria. Rare, Knowle Hill, 1893; Trough of Bowland, meadow above Newton.

Equisetum maximum. Near Dunsop Bridge and Whitewell. Very fine.

Lycopodium Selago. Brennand Fell, with *Cryptogramme crispa.*

Lycopodium clavatum. Local name, 'Shepherd's Crook.' Whitendale, and Grindleton Quarry.

NOTES on LINCOLNSHIRE PLANTS.

Seedless Plants.—I gathered *Calamintha arvensis* in a Lincolnshire limestone quarry at Coleby, Div. 13, and *Juncus obtusiflorus* from a little pond in a field just outside Howsham Barf Wood, Div. 3, and in both cases, though perfectly healthy, neither species contained any seed. I only saw one plant of the *Juncus,* but the *Calamintha* was growing in plenty, but it was all alike barren.

As my type collection of seeds is used for naming the species found in the crops of birds, I should be very thankful to botanists for type specimens of the rarer British species of plants.—E. Adrian Woodruffe-Peacock, Cadney, Brigg, Lincolnshire, 20th Oct. 1900.

Some Flowering Plants at Sapperton, Lincolnshire.—The following extract is out of a letter from Miss S. C. Stow, of Court Leys, Brandon, Grantham, dated 1st November 1900:—'At Sapperton, Div. 15, it was too late in the season to do much with flowering plants, but I came across several I had not seen in Div. 15 before. For instance, *Linaria spuria* and *L. elatine* were most abundant in the stubbles, and I never remember seeing *Thlaspi arvense* so large or so abundant anywhere else. A piece of waste ground, where the turnip crop had failed, was quite green with young plants. The same patch of ground was carpeted with *Lamium amplexicaule.* Some of these plants had corollas three-quarters of an inch long, while others were no longer than the calyx. *Geranium pusillum* was most abundant among the root crops, much more so than any other *Geranium.* I also took the semi-variety, or, as you would call it, state, *nodosum* of *Phleum pratense.* I had not looked out for it before.'—E. Adrian Woodruffe Peacock, Cadney, Brigg, 8th December 1900.

NOTES on BIRDS.

Iceland Falcon at Saxilby, near Lincoln.—In December, early in the month, there was shot at Saxilby, near Lincoln, by Dr. Rainbird, of Saxilby, a young female specimen of the Iceland Falcon (*Falco islandus*), which is being stuffed by Mr. Nash, of Lincoln. This is an unusual occurrence. It was probably brought south by some of the strong gales which we have experienced as a variation to this hitherto abnormally mild season.—J. Conway Walter, Langton Rectory, 22nd December 1900.

Grey Phalarope and Purple Sandpiper at Kirton, near Boston. A Grey Phalarope (*Phalaropus fulicarius*) was shot in the marsh, near Kirton, by Boston, on 9th November last, by Mr. W. E. Parker, of Lancashire. This is a very unusual occurrence in Lincolnshire, only two of these birds being known to have been shot in the last twenty years.

The same gentleman shot in the same locality on 19th November a Purple Sandpiper (*Tringa striata*). This is not so uncommon a bird.—J. Conway Walter, Langton Rectory, Horncastle, 22nd December 1900.

Wild Swans, etc., near Gainsborough. Six wild Swans observed to-day (14th January 1901) on the flood water in the Great Marsh meadows, Lea, Gainsborough. Most of the flood has subsided, but a large expanse of water still remaining was black with Duck of various species, with (I think) some Geese among them. The Swans, which I observed for some time through a telescope, were all in mature plumage, with the exception of one, which looked considerably darker in colour than its companions. There were also large numbers of Gulls of various species on the dryer ground, and large flocks of Lapwings (*Vanellus vanellus*). Margaret L. Anderson, Lea Hall, Gainsborough, 14th January 1901.

Long-eared Owls as Anglers. Mr. J. Howsman pointed out to me on the 29th March 1887 the nest of a pair of Long-eared Owls (*Asio otus* L.). It was in a Scotch fir, just in the parish of Bottesford, near the race of Messingham water mill (Nat. Hist. Div. 2). He showed me their castings at the same time, saying 'that the Owls catch the best fish when the water wheel is not running. If you come back from the farm this way, and get here at about five this evening, you will be in time to see them set to work.' I did so. The wheel had hardly ceased to revolve before the Owls left their tree and were in evidence. They knew their work, for they let the water run off a little before they began to fish. The birds in turn would swoop down into the shallow water, which was barely $2\frac{1}{2}$ in. deep, and fly off with a fish—a Dace (*Leuciscus vulgaris* Flem.) from three to five inches in length generally—to the nest tree. Droves of Dace come up the beck each spring, but few, if any, get above the mill dam. They have many enemies as well as the Owls, and few can return to the river Trent.—Max Peacock, Bottesford, 4th May 1900.

North-West Lindsey Bird-Notes.—The late David Hopkins, who farmed Howsham Barf from 1845 to 1870, was a naturalist in a simple way, and loved the birds and beasts to be found on or around his holding. He left the following stuffed specimens behind him; they are now in the possession of his daughters at Brigg, having been moved just a year ago from this parish.

The following birds were obtained in Howsham Barf Wood or the Beck below it:—Kite (*Milvus milvus*), Long-eared Owl (*Asio otus*), Blue Tit (*Parus cæruleus*), Marsh Tit (*P. palustris*), Great Tit (*P. major*), Long-tailed Tit (*Acredula caudata*), Mistle Thrush (*Turdus viscivorus*), Bullfinch (*Pyrrhula pyrrhula*), Chaffinch (*Fringilla cœlebs*), Greenfinch (*Ligurinus chloris*), Goldfinch (*Carduelis carduelis*), Wren (*Troglodytes troglodytes*), Yellow-hammer (*Emberiza citrinella*), Woodcock (*Scolopax rusticola*), Dipper (*Cinclus aquaticus*), Dabchick (*Podiceps fluviatilis*), Black-headed Gull (*Larus ridibundus*), two Snipe (*Gallinago cœlestis*), and a male and female Reed Bunting (*Emberiza schœniclus*).

As these specimens have been removed from this parish it is as well to put them on record. The Kite and Dipper are valuable notes.—E. Adrian Woodruffe-Peacock, Cadney, Brigg, 15th May 1900.

Naturalist,

NOTES on BIRDS of DURHAM.

The Nuthatch as a Durham Bird.—The Nuthatch (*Sitta europœa*), one of the most beautiful species of British birds, is only a rare casual visitant to the north of England. The late John Hancock, in his 'Catalogue of the Birds of Northumberland and Durham' (1874), states that he knows of no instance of the occurrence of this bird in Northumberland, and I have never heard of its appearance in that county since that date, though it may have appeared. Mr. Hancock states that [in Durham] it bred regularly 30 or 40 years ago [about 1834-1844] in the Bishop's Park at Bishop Auckland, but it is no longer to be found there. The late Robert Calvert in his 'Geology and Natural History of the County of Durham' (1884), says 'this bird was quite common in the Bishop's Park at Bishop Auckland, 50 years since, but it is now a rare casual visitor—I have not seen one for 30 years.' The late Thomas Hann informed me that he had found the Nuthatch near, and preserved specimens from, Whitworth Hall and Old Park Hall, near Byer's Green, between 1860 and 1880. Can any reader of 'The Naturalist' give any records for Durham later than these years, or give any records at all for Northumberland? Perhaps some ornithological observer could oblige the readers with notes on the Nuthatch as a north of England bird, dealing with its occurrence in the counties of which 'The Naturalist' is the recording journal.—J. W. FAWCETT, Satley, Darlington, 20th November 1900.

The Waxwing as a Durham Bird.—The Waxwing (*Ampelis garrulus*) is a casual visitor in the county of Durham, appearing at irregular periods. generally in severe winters, and often in great numbers. They feed chiefly on the berries of the mountain ash or rowan tree, hawthorn, holly, ivy, juniper, and wild rose.

The following are the records of the appearance of this bird in the county of Durham, from my 'Birds of Durham' (1890) and naturalist's note book:—The Waxwing appeared at Greatham, near Stockton, in 1829, and was also seen in different parts of the county in 1835. The late Thomas Grundy, my collaborator in 'Notes on the Birds of the Derwent Valley' (1891), shot three on the Bradley estate between the rivers Derwent and Tyne, in this county, between 1836 and 1847, and between 1847 and 1854 he shot either seven or nine, at Norwood, on the river Team, on the Ravensworth estate, where they were feeding on holly berries. Mr. J. H. Gurney, jun., told Mr. J. Hancock that 19 specimens were captured in South Durham in 1849. It was of rather common occurrence in this county in 1850. It also appeared in 1863, when several were shot in various parts of this county, one as far west as Wearhead. It again appeared in the winters of 1866 and 1867, in both years of which it was rather abundant, especially in December and January of the latter year. In the former year it was very abundant in Weardale, and some large flocks, one of which was computed to number some hundreds, were seen. Several smaller flocks were noticed near the city of Durham. In the latter part of September 1870, over a hundred made their appearance in Weardale, where they remained until the latter part of November, when they disappeared. Some dozens were shot, and the Tinkler brothers, the local taxidermists, preserved over 60 specimens for various persons. Some were also seen in the Upper Derwent Valley that same year, and Mr. J. F. Robinson (the founder and first president of the Vale of Derwent Naturalists' Field Club) told me that one was shot at Lockhaugh, in the lower part of that valley, between Rowland's Gill and Winlaton, that same year. Stragglers were also seen in various parts of the county—Teesdale, Weardale, and Lower Derwent—in the winters of 1871-2, 1878-9, and 1883-4. At least six of these birds remained about the hedge-rows near Neasham, on the Tees, from December 1885 to March 1886, feeding on the hips and haws. Two were shot near Darlington in November 1886, and several were noticed in the vicinity of the city of Durham in March 1887. Of late years the appearance of the Waxwing in Durham has been very scant.—J. W. FAWCETT, Author of 'The Birds of Durham,' etc., 20th November 1900.

NOTES on LINCOLNSHIRE MAMMALIA.

Stoat's Nest in a Mole Hill.—On 4th May 1890 I had a round with my old friend the mole-catcher. At that time he was trapping in Butterwick, a hamlet of Bottesford, situated on the banks of the Trent. On this occasion he dug out four or five of the large 'mole houses' in which were young ones. All these large hills were situated on land just above the flood-line, some in the open part of the field, others in the centre of a hedge-row. The last to be examined rather puzzled us at first, but we soon found out what was wrong. Mr. and Mrs. Stoat (*Putorius ermineus*) had taken a lease of the premises, or perhaps they held it by right of conquest. I think there can be no doubt but that they had slain the old father and mother Mole (*Talpa europæa*), and then feasted on the young ones. Finding the house to their liking they remained. If we had not disturbed them they no doubt would have made it their headquarters for the spring and summer. In the nest were three young stoats and a partially eaten lark. In my opinion the young were unable as yet to eat, so I suppose Mr. Stoat had caught it and brought it to his wife when 'lying in.' The Lark or what remained of it had been killed some days. My friend showed me the place where he hung up his catches. Here I noticed four Weasels (*Putorius putorius*) and two Stoats, one or two Water Voles (*Arvicola amphibius*), and some Rats (*Mus decumanus*). All these had been taken in his mole-traps during this spring. Lyon also told me that the Mole never nests very far from water. He believes that they sink wells underground for their own convenience; his reason for thinking so is that they are seldom seen drinking at a drain side or pond, but that they often sink a deep shaft down below the water, which of course soon fills and thus affords them liquid without coming out to drink. Owls, he says, kill a great many, but the Stoat and Weasel are their deadly foes.—Max Peacock, The Manor, Bottesford, Lincolnshire, 4th July 1900.

Swimming by Moles, Hedgehogs, etc.—That most of our animals and birds can naturally swim is well known to the average field naturalist, but many of us have not seen several birds and beasts attempt to do so. I quite well remember my surprise on coming across a Mole (*Talfa Europæa*) taking a swim across the Trent from Div. 2 to Div. 1; the place of transit was from Flixborough Stather in Div. 2 to Amcotts in Div. 1. The river here is two hundred yards across. Hedgehogs (*Erinaceus europæus*) I have only seen once braving the watery element. I was trapping Rats that came to a duck-coop placed on the fish-pond side at Bottesford Moors, Div. 2. One evening I heard a Rat squealing in one of my traps, so went down to the pond to put an end to the poor beast's suffering. What was my surprise when I saw a pair of old Peggy-hotchins—as we Lincolnshire folk call the Hedgehogs—swimming from the north bank of the pond to where my trap was placed. They were not long paddling the distance, some eighteen or twenty yards. When they arrived at the shore they made straight for the young Rat, which was caught by its off hind-leg. The old dog Hedgehog at once seized the Rat by the back of the neck and then rolled up into a ball, leaving the hind-quarters of the Rat protruding from the ball of pricks. Poor Rat, it had no chance; its leg was torn from the trap by this fierce onslaught. Mr. Hedgehog soon unrolled and he and his wife made a meal off the carcass. A charge of No. 5 shot put a stop to their ratting excursions. I killed them only when near my young poultry, well knowing that they are very industrious in slaying slugs, snails, etc. The Hedgehogs' skins adorned the top bar of a gate for years along with others of their kind. These skins are nailed on to stop lads climbing the gates into an orchard. It is a common practice to place them in such positions. Hares (*Lepus europæus*) I have seen swim across Bottesford Beck on several occasions. Rabbits (*L. cuniculus*) I have known swim a drain that was too wide to jump. They were tempted by a field of carrots. Pheasants (*Phasianus colchicus*) and Partridges (*Perdix perdix*) will both swim well when they fall into water. I have seen them do so on more than one occasion, when only winged.—Max Peacock, The Manor, Bottesford, Lincolnshire, 13th July 1900.

Naturalist,

BIRD NAMES AND LORE.

MAX E. PEACOCK,

The Manor, Bottesford, Lincolnshire.

To any one who will give the matter a few hours study and attention it will become evident that the names by which we colloquially call our birds are derived for the most part from some trait of character or coloration. No better example of this can be given than *Vanellus vanellus*; here we have the Latin name distinctly pointing out the mode of flight and sound thereby made. If we look to its English names we shall find much more depicted:—Peewit, Peasweep, Peawit, Pyewipe, Feaswipe, Tufted Pyewipe, Green Pyewipe, Green Plover, Lapwing, and several other like forms. Most of these names are given in imitation of the cry, but Lapwing denotes its mode or manner of flying and the noise thereby made. Tufted Pyewipe points to its crest; Green Plover to its colour. The family of Terwyt or Turret no doubt take their name from this bird. They bear Peewits as their coat-of-arms. The French local form is 'Dix huit.' We have taken this bird as a type to show what we mean, but it is by no means the only one.

The origin of our bird names may be roughly divided into seven primary heads as follows:—No. I., Colour; No. II., Cry; No. III., Motions; No. IV., Formation; No. V., Habits; No. VI., Habitat; No. VII., From peculiarity of Nest.

These primary heads may again be divided into sub-classes. To show what we mean we will give an example of the first two heads:—

PRIMARY HEAD No. I.

Sub-Div. I.—General colour.
,, II.—Colour of head.
,, III.—Colour of legs.
,, IV.—Colour of parts mentioned.
,, V.—Shape, etc., of colour.

Now for examples of these sub-divisions:—

Sub-Div. I.—Golden Oriole, Blackbird.
,, II.—Blackcap, Redcap, Redpoll.
,, III.—Redshank, Greenshank.
,, IV.—Black-backed Gull, Red-necked Grebe.
,, V.—Ring-Dove, Spotted-Crake.

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PRIMARY HEAD NO. II.

Sub-Div. I.—Imitation of voice.
,, II.—Sound of wings.
,, III.—Description of sound.

Examples of these sub-divisions :—

Sub-Div. I.—Cuckoo, Nightjar.
,, II.—Lapwing, Bustlewing.
,, III.—Whistling Swan, Hooting Owl, Meadow Crake.

Thus we might go on through all the primary heads sub-dividing, but the examples we have given are quite enough to show the reader what we mean. Formation often gives the name. Crossbill, Thick-knee, Pintail, are examples that come first to mind. Amongst names denoting actions on the part of birds we have Wagtail, Turn-stone, Tree-Creeper, Woodpecker. The habitats of birds are distinctly shown in Denmark Crow, or Denny, as it is sometimes shortened into, French Partridge, Moor-hen, Grass-chat, Sky-lark, Marsh-Harrier. Motion is depicted by Wind-hover, Diver (various sorts), Dollpopper (the Dabchick that pops under the water like a flash of light if anyone intrudes on its haunts). Food of birds is indicated in Flycatcher, Sparrow Hawk, Duck Hawk. The nest of the Long-tailed Tit gives us the local Lincolnshire name Feather Poke (Poke, i.e., bag, as in the well-known proverb, 'Don't buy a pig in a poke'), but it is as often called the Bottle Tit as not, from the shape of the nest. Many more instances could be given, but these examples quite explain how birds come by some of the names they are commonly known by. For a few birds we have pet names, Jenny Wren, Jenny Howlet, Jack Heron, Tom Tit. Other local names denote the size, as Great-Snipe, Full-Snipe, Half-Snipe (which mean Solitary Snipe), Common Snipe, Jack Snipe. Local names for birds vary much, some having noticed one peculiarity, some another. In a few places the Common Coot is called Bald Pate, in other parts of the country it is called Blether Head or Bleather Pate, from the resemblance its bald head has to a blown-up bladder. Our local names for plants are given to the different species much in the same way as we have described those of birds; medical qualities playing a great part in their everyday nomenclature. Much folk-lore is mixed up with some of our local names—Goat-sucker for example. The poor Nightjar, or Fern Owl, was in olden times accused of sucking the milk from the cows and

goats. Certainly it is often seen flitting about, round, under, and over them, but it is not intent on seeking the cow's udder, nor the milk contained therein. Its business is quite of another character altogether. Where cattle are flies abound; the movement of the grazing herds disturb many a fat moth and beetle from amongst the long bents. It is these that the Nightjar is after. Instead of being an enemy of man it is one of his best friends.

We know old men and women who yet make the sign of the cross when they meet or see a solitary Magpie (*Pica pica*). They know not why they do so; they think it some charm that takes away the evil that this meeting portends. They have no idea they are praying in dumb show to the Supreme Being who guideth all things for the best. These old Catholic feelings and signs are now not understood, but for all that they are retained by many a staunch Protestant. Our country customs, words, sayings, and lore are a study that grows on one, and the more we follow it up the further we find ourselves from the end of our search. Truly, the tree-of-knowledge extends its branches to the uttermost corners of the world and to the beginning of time.

Some of our readers may never have noticed that the lining of the various nests we come across give us in a great many cases an idea of the animals, birds, and other objects that inhabit a district. As an example, we have remarked that round the confines and within a deer park we used to know well the nests of Chaffinch, Robin, and other of the lesser birds, not forgetting the Jackdaw, were as a rule lined with hairs from the backs of Fallow Deer. At another spot we wot of the Red Deer furnish the last layer of material. Where the roan breed of cattle are to the fore the inside of the nest partakes of that shade of colour within; where the dark red cattle are mostly kept the lining of the nest has a chestnut appearance. We have found Jackdaws' nests that were lined entirely from fur of the silver-haired Rabbit; this shows that in the neighbourhood of the nesting-place the silver-haired Rabbit was the prevailing breed of the locality.

In the neighbourhood of the moors where the Red Grouse flourish the nests of the Tits and the Willow Wren have quite a different appearance to those of other districts, at least I have often noticed this to be the case. Even our farmyard fowl can be located by the feathers found in nest linings. Feathers of the Guinea-fowl are great favourites with the Sparrow, so are the buff and white ones from the hens. The birds that use hair

generally seek for it on rubbing-posts, palings, rough walls, trees, and gates. I once had the opportunity of watching what birds came to a row of posts for lining material. When living at home at Bottesford Manor, North-West Lincolnshire, I had a wooden gun-room and workshop in a plantation adjoining the garden. In front of one window that faced the south was a fence composed of larch posts and barbed wire. Chaffinches, Linnets, Greenfinches, and Goldfinches all came here to get the material for nest lining. They used to perch first on a post, then hop on to the wire close to where a bunch of hair was sticking at the back of one of the barbs; this they worked at until they had extracted half-a-dozen or so hairs which they carried crosswise in the bill. I thus became aware of the nests of these little songsters. Even the breed of sheep that graze in our fields may more or less be determined by one who understands wool-lore. These facts cannot be of much use to us in the old country, but in unexplored districts little facts like these often help the field naturalist and sportsman to determine whether or not a bird or an animal visits a certain district. Those who have made a study of the different sorts of Caddis-Worms must have noticed what a various collection of objects they get together when house-building. Shells of freshwater molluscs often form a conspicuous part of their movable homes. On one occasion a shell was obtained in this way which up to that time had been sought for in vain, although diligent search has brought it to light since then.

From notes made 10th August 1887.

NOTE on LANCASHIRE ANNELIDS.

Annelids Noted at Heaton Moor, near Stockport.—On 4th March 1899, during a brief visit to Heaton Moor, between Stockport and Manchester, I was able to devote an hour to collecting. The weather was bad, and I was therefore driven off the field without obtaining any earthworms save two common species. The day will be memorable, however, because it has yielded a white worm which is evidently new to science. I propose to name this species *Enchytræus pellucidus*. It is a typical white worm with all the usual characters of the Enchytræids, and has setæ in four bundles of four in front and three behind. The list for the day numbers five species.

Allolobophora calignosa (Savigny). Under an old tree stump by the Peel Moat, Heaton Moor.

Allolobophora chlorotica (Savigny). Same locality.

Tubifex rivulorum Lam. In streamlet behind the Home for Incurables, Heaton Moor.

Pachydrilus verrucosus Clap. Same locality. Only one specimen was procured, but there is little reason to doubt the accuracy of the identification.

Enchytræus pellucidus Friend. In manure heap, Heaton Moor; new to science. About twenty specimens taken, adult, in good condition.—HILDERIC FRIEND, Ocker Hill, Tipton, 14th March 1899.

Naturalist,

REPTILES AND AMPHIBIANS OF THE SKELMANTHORPE DISTRICT.

FRED LAWTON,

Skelmanthorpe, Huddersfield.

Our district is the well-wooded, well-watered area that lies within a radius of four miles round Skelmanthorpe. Within that area are to be found the following townships:—Skelmanthorpe, Shelley, Shepley, Kirkburton, Emley, Flockton, Bretton, High Hoyland, Clayton West, Cawthorne, Gunthwaite, Ingbirchworth, Denby, and Cumberworth. There are Bretton, Cannon Hall, Bagden, Gunthwaite, Storthes Hall, and Rockwood Parks, with their fine lakes and large woods. There are innumerable streamlets, rippling through well-wooded valleys and rich pasture lands; fine old English lanes, with high banks and tall hedgerows; here and there a marshy place, and on the Ingbirchworth side is a fine stretch of Yorkshire moorland. The scenery is very irregular, and as one walks along it seems to change every few yards; in fact, ours is a naturalist's paradise, though situated in the centre of the commercial life of the West Riding.

The following is a list of reptiles to be found in our district. They are all supposed to be venomous in this neighbourhood, and on that account are killed. It is only when people see you handle them that you can make them believe otherwise.

Zootoca vivipara. **Common Lizard.** Common on Rusby Piece.

Anguis fragilis. **Blindworm.** Rare; Deffar Wood.

Tropidonotus natrix. **Common Snake.** Seen occasionally in Deffar Wood.

Triton cristatus. **Great Water Newt.** Common all over district. The Newts are known locally as 'Water Askers.'

Lophinus punctatus. **Common Newt.** Very common.

Lophinus palmatus. **Palmate Newt.** Niggar Dam and Jacob's Well.

Rana temporaria. **Common Frog.** Very common.

Bufo vulgaris. **Common Toad.** Common all over district.

Bufo calamita. **Natterjack.** Thirty or forty years ago they were to be found in Clayton West and Skelmanthorpe, now, I believe, they are extinct. I well remember a great-uncle

of mine, who was born at the beginning of the nineteenth century, telling me a story of a large stone, part of a fire-place, in an old house in Skelmanthorpe. The stone was accidentally broken and a live toad was found embedded in it. He said, 'You know the toads with the yellow mark down their backs, that walk about in Ben Haigh's quarry, are not like other toads and frogs. They have all come out of stones where they have been for hundreds of years.' I said I thought not. At this my uncle was very cross, and said they told him so when he was a boy. Some thirty years ago I could always find a few in Haigh's quarry, but after the quarry was broken up and sold for building purposes, I lost sight of them until some ten years ago, when, while out mothing with a friend, we came across one near Jacob's Well. Every year since then I have seen one occasionally, till last year I missed my old friend. I am afraid I shall see it no more. It might be that it died of old age, or some cruel boys killed it in sportive play, or perhaps

> When there was no response
> To his amorous croak, he sickened,
> The last of his race, and died.

NOTE on LINCOLNSHIRE DIPTERA.

Diptera Captured in Lincolnshire in 1900.—I have seen the following species, taken at Skegness by Prof. J. W. Carr, M.A., F.L.S., of Nottingham:—

Thereva annulata.
Common, 30th June 1900.

Chloromyia formosa. 30th June 1900.

Stratiomys chamæleon.
One example, 18th July 1900.

Philonicus albiceps.
One ♂, 30th June 1900.

Nemotelus uliginosus.
One ♀, 23rd July 1900.

The following were captured at Bottesford, Div. 2 S., during 1900, by Mr. Max Peacock:—

Sarcophaga carnaria.
Tipula oleracea.
Lucilia cæsar.
Platychirus manicatus.
Melophagus ovinus.

The following were collected at Manton Common, Div. 2 S., and sent me by Mr. Max Peacock in November 1900:—

Sarcophaga canaria. ♂.
Musca corvina.
Stomoxys calcitrans.
Pollenia rudis.
Eristalis tenax.

The following were collected at Skellingthorpe Wood, near Lincoln, Div. 13 W., on the 27th May 1900:—

Eristalis intricarius. Two ♂s.
Rhingia rostrata.

—Alfred Thornley, South Leverton, 5th January 1901.

LINCOLNSHIRE NATURALISTS AT HORNCASTLE.

Rev. EDWARD ADRIAN WOODRUFFE-PEACOCK, L.Th., F.L.S., F.G.S.,
Vicar of Cadney; Organising and Botanical Secretary, Lincolnshire Naturalists' Union.

On Wednesday, 13th June 1900, the 25th meeting of the Lincolnshire Naturalists' Union was held at Horncastle. Wednesday is a bad day for Lincolnshire men, and the weather was uncertain and showery too, so a small attendance was the result. Starting from the station, within a few moments of their arrival the Rev. J. Conway Walter, the President of the Union, took Mr. F. M. Burton, F.G.S., to the Art School to view an interesting collection of local fossils, which Miss Foster, the head teacher, has brought together. Then starting in carriages, a pause was made at the foot of Thimbleby Hill, where the site of a Roman grave, constructed of rude slabs of Spilsby sandstone, was pointed out. It contained human bones, a sword and spear head, and the bones of a dog, and was the resting place, no doubt, of some mighty hunter of the past who loved his hound. At the village of Thimbleby another pause was made close by the church to look at three large ice-borne boulders of Neocomian limestone. A further drive of 200 yards brought the party to Hollgarth, where there is a field with an avenue of very fine old trees called 'The Butts.' Here, no doubt, in the spacious times of Queen Elizabeth,

> Village archers of old,
> Robin Hoods true and bold,
> Unerring in hand and in eye,
> Showed their skill in their craft,
> When with yew bow and shaft,
> They aimed at, and hit, the bulls-eye.

Passing through Wispington, where the vicar, the Rev. J. A. Penny, exhibited a number of local antiquities, a three mile drive brought the members to Hungram Gorse. This is an unreclaimed waste of twelve acres, which takes its name from the Danish chief Hungar (Latin, Hungarum), who, with his brother Hubba (there is a Hubbard's or Hubba's Bridge between Spalding and Bourne) ravaged the whole country, A.D. 875, in revenge for the murder of his father. Two brickyard pits, near Wragby, were then visited. The workmen there have recently discovered the value of the fossils, and where the guide only three weeks before had found them in abundance, none were

then to be seen. A large consignment had just been sent to town. The party then turned back to the park, woods, and lakes of Stourton Hall, where they worked as long as the rain kept off. The Red Lion Inn at Baumber proved a welcome refuge during a very heavy shower. At Edlington Grange on the way home, the Rev. J. Conway Walter pointed out the site where till recently a large boulder stood. It was 10 feet high, 4 feet wide, and 3 feet thick, and consisted of Neocomian limestone. Its weight was estimated at 10 tons. Two years ago it was destroyed as being a nuisance in ploughing.

The geology of this district is not of a very interesting type. The Kimeridge clay is almost wholly buried by boulder clay, which, at Thimbleby and Langton, is again overlaid by plateau gravel and sand. Along the river Bain, which flows through Horncastle, patches of ancient gravel of the old river are to be found at a higher level than the modern river gravel and alluvium.

The flora was the usual boulder clay species, if anything rather poorer than usual. I make the following selection from notes taken by Mr. J. S. Sneath and myself:—*Silene cucubalus* (on gravel patches), *Trifolium medium, Geum intermedium, Viburnum Opulus, Cnicus acaulis, Linaria minor* (here a native, with us it is generally an alien), *Galeopsis Tetrahit, Polygonum amphibium, Avena pubescens, Ophioglossum vulgatum, Viola ericetorum* (in Hungram Gorse; not quite typical). A *Mentha*, from the same spot, not in flower, I could make nothing of. I sent it to Mr. F. A. Lees, who replied:—'The *Mentha* is also new to me. If an *arvensis* form it is most likely the lost *pratensis* Sole. It has a *sativa* smell, not *arvensis*, however. It may be a very good find indeed.' It has been sought for again in vain by Revs. J. Conway Walter and J. A. Penny.

Mosses were difficult to find. At Thimbleby I took *Pleuropus sericeus*, at Hungram Gorse *Hypnum purum*, at Hatton Brick-yard *Hypnum cuspidatum*, and at Stourton Wood *Polytrichum formosum* and *Orthotrichum affine*.. A poor lot for such a wide sweep.

The Rev. A. Thornley, F.L.S., F.E.S., reports:—The day was too cool and cloudy and gave us a wet afternoon. In Hungram Gorse a nice bug, *Piezodorus lituratus*, was beaten from broom, with a few very common beetles. From birch another bug, *Acanthosoma interstinctum*, was obtained. At the Hatton Brick Pit, that pretty little dragon-fly, *Ischnura elegans*,

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turned up, but most examples were very immature; also an example of the small red dragon-fly, *Pyrrhosoma minium*. The only butterflies seen on the route were a very few examples of *Epinephele janira* (the Meadow Brown) and *Anthocaris cardamines*. Through the kind hospitality of Mr. F. M. Burton, an enjoyable morning was spent in the woods near Gainsborough on the 14th, and some nice captures made. In the woods about Gainsborough *Melanippe albicillata* was seen and captured; *Abraxas ulmata* was not uncommon; a single beautiful example of *Tephrosia crepuscularia* was found at rest; and also many of the commoner 'Carpets' were about. The beautiful Tineid Longhorn Moth, *Adela viridella*, was very common; and a batch of caterpillars of *Scopelosoma satellitia* was discovered under an old piece of sacking, probably blown from the trees by a high wind, they had thus congregated for shelter. Amongst the saw-flies, *Tenthredo livida* and *T. melæna* turned up. *Cephus pygmæus*, the 'Corn Saw-fly,' was swarming in buttercups. *Allantus tenulus* and *Pamphilius hortorum* were not uncommon in sunny patches of the woods. With regard to other hymenoptera, *Andrena fucata*, *Gorytes mystaceus*, and *Nysson spinosus* were all found. A few common diptera were observed, the best being *Syrphus lunulatus* and a species which I believe to be *Nemoræa puparum*.

The Rev. J. Conway Walter has let me have the following list of animals, birds, and reptiles. The district to which he refers stretches from Kirkstead through Woodhall to Horncastle, and includes the parishes in the Bain valley below that town. Where the notes refer to a parish outside these limits the parish is named.

Animals.—The Flitter-Mouse, Urchin, Mole, Common Shrew, Water Shrew, and the variety called the Oared Shrew, Badger, Otter, Weasel, Stoat, Polecat, which is not so rare in this neighbourhood as elsewhere in Lincolnshire; the Pine-Martin, still not very uncommon; the Fox, Squirrel, Harvest Mouse, Long-tailed Field Mouse, House Mouse, Rat; the Black Rat he has never met with; the Water Vole, Short-tailed Field Vole, Long-tailed Field Vole, Hare, Rabbit.

Birds.—The Missel Thrush, Song Thrush, Redwing, Fieldfare, Blackbird, Ring-Ousel, Wheatear, Whinchat, Stonechat, Redstart, Redbreast, Nightingale, Peggy Whitethroat, Lesser Whitethroat, Blackcap, Garden Warbler, Golden-crested Wren, Chiffchaff, Willow Wren, Wood Wren, Reed Warbler, Sedge Warbler, Grasshopper Warbler, Hedge Sparrow, the Dipper,

Long-tailed Tit, Great Tit, Blue Tit, Coal Tit, Marsh Tit, Nuthatch, Wren, Tree-Creeper, Pied Wagtail, Yellow Wagtail, Tree-Pipit, Meadow-Pipit, Great Grey Shrike (at Stowe by Lincoln), Red-backed Shrike, Waxwing, Spotted Flycatcher, Swallow, Martin, Sand Martin, Greenfinch, Hawfinch, Goldfinch, Siskin, House Sparrow, Tree Sparrow, Chaffinch, Linnet, Lesser Redpoll, Bullfinch, Corn Bunting, Yellow Bunting, Reed Bunting, Snow Bunting, Starling, Jay, American Blue Jay (no doubt an escape), Magpie, Jackdaw, Carrion Crow, Hooded Crow, Rook, Skylark, Woodlark, Swift, Nightjar, Wryneck, Green Woodpecker, Greater Woodpecker (by far the rarest), Lesser Woodpecker, Kingfisher, Roller (at Gautby), Hoopoe, Cuckoo, Barn Owl, Long-eared Owl, Short-eared Owl, Tawny Owl, Hen Harrier (at Woodhall, and at Hatton in 1899), Common Buzzard, Golden Eagle (in 1854), Bald or White-headed Eagle (*Haliaëtus albicilla* – at Gautby, on 8th November 1890, as it was in the act of chasing a hare; it is a South-Eastern European species, but may have been an escape), White-tailed Eagle, Sparrow Hawk, Kite, and I can remember when its appearance in the sky was not an uncommon occurrence, Honey Buzzard, Peregrine Falcon (at Gautby), Merlin, Kestrel, Common Cormorant, Gannet, Heron (one nest has been known at Woodhall Spa), Common Bittern (at Woodhall, Horsington, and Holbeck), Grey-lag Goose, Bean Goose, Pink-footed Goose, Canada Goose (*Bernicla canadensis* –no doubt an escape, shot at West Ashby), the Whooper, Mallard, Shoveller, Pintail, Teal, Wigeon, Common Pochard, Surf Scoter (1865, storm-driven into river Bain), Ring-Dove, Stock-Dove, Turtle Dove, Pheasant, Partridge, Red-legged Partridge, Quail, Land-Rail, Water-Rail, Moorhen, Coot, Bustard (a male was shot at Addlethorpe, on our coast, and three hen birds were seen afterwards; when I come across the exact date I will publish it), the Golden Plover, Lapwing, Woodcock, Great Snipe, Common Snipe, Jack Snipe, Ruff, Green Sandpiper, Spotted Redshank, Common Curlew; the Razorbill, Little Auk, and Stormy Petrel were all storm-driven into the district with a number of unnamed Gulls; the Little Grebe may be seen on the quieter waters of this district too.

Reptiles.—Frog, Toad, Common Newt, Grass Snake, Viper, Blind Worm, and Common Lizard.

The day ended with a most enjoyable entertainment at Langton Rectory, where the President had much more to show than the members had time left to view and examine.

Where the Boulder Clay is thin or denuded some fine exposures of the Kimeredge Clay are found in ditches and brick-pits. Miss Annie Foster, of the Science and Art School, Horncastle, has begun to make a study of pits, and has sent me the following notes:—At Horncastle, in North Street, at Harrison's Pit, she found Encrinoid, Iridescent Ammonite, and Calcareous Nodules; at Hatton, about seven miles north-west of Horncastle, in a brick-pit (working), vertebræ of *Ichthyosaurus communis*, a shoulder paddle (?) of *Ichthyosaurus*, and *Gryphea*; at Stourton, about six miles north-west of Horncastle, in a brick-pit (disused), fossil wood and calcareous deposits; at West Ashby, two miles north of Horncastle, she dug fossils from a ditch, Saurian vertebræ; at Fulletby, three miles north-east of Horncastle, in a brick-pit (disused), she found Saurian vertebræ, *Ostrea* in abundance, large Belemnites, parts of *Ammonites communis* and shales, several feet being exposed in vertical section.

NOTES on LEPIDOPTERA.

***Gonoptera libatrix* at Manton Common.**—This has been collected in 1900 by Mr. Max Peacock, and sent me for identification and record. —Alfred Thornley, South Leverton, 5th January 1901.

***Colias edusa* and *Vanessa io* in South Lincolnshire.**—Specimens of this butterfly were seen on the roadsides between Sapperton and Ropsley on 8th September, and at Court Leys, Caythorpe, on 15th September. The last time we saw any in this neighbourhood was in 1892.

Vanessa io has been unusually abundant here this season.—S. C. Stow, Court Leys, Brandon, Grantham, 22nd September 1900.

***Aplecta occulta* in Cleveland.**—A few specimens of this fine noctua have occurred in the Cleveland district this summer, and being the first I have come across in this district during some years' working, I thought they would be worth recording. The first specimen I took was at sugar in the garden at Linthorpe, Middlesbrough, on the 28th August. Another specimen was taken on the 31st, also at sugar, being a ♀, which had a large quantity of ova which unfortunately proved infertile. Another specimen was taken at Middlesbrough about this time by my friend Mr. W. Sachse. Another friend of mine, Mr. Frank Atkinson took two specimens and missed three or four others at sugar at Glaisdale.—T. Ashton Lofthouse, The Croft, Linthorpe, Middlesbrough, 15th November 1900.

Captures of Lepidoptera at Middlesbrough.—The following are a few insects I have taken in the garden at Linthorpe, Middlesbrough, during the past season:—

Plusia festucæ. I took one at Valerian flowers at early dusk on the 20th July.

Mamestra abjecta. Two at sugar on the 9th of August.

Epunda lutulenta. The first specimen taken at sugar on the 24th August; others occurred on the 27th, two; the 28th, one; the 30th, two; 3rd September, two—all ♂s; 4th September, two, ♂ and ♀; 5th September, two ♂s.

Anchocelis lunosa. A single specimen at sugar on the 4th September. T. A. Lofthouse, Linthorpe, Middlesbrough, 15th November 1900.

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NOTES on FUNGI.

Abundance of White Rust on Crucifers at Hibaldstow.—At Hibaldstow, on 22nd October 1900, I found the White Rust fungus (*Cystopus candidus* Lev.) so common on crucifers infecting some plants of that order, especially *Bursa.* Mr. George Massee, of Kew Herbarium, kindly named it for me.—E. Adrian Woodruffe Peacock, Cadney, Brigg, 29th October 1900.

***Poronia punctata* near Hedon.**—On 29th December 1900, when walking over Saltend 'Stray,' I found a group of *Poronia punctata* growing on horse dung. One small piece bore more than one hundred and twenty specimens, which were equally distributed over both the upper and under surface. The 'Stray' is old reclaimed land, but was accidentally flooded with salt water last August. The identification has been confirmed by Dr. C. B. Plowright, King's Lynn.

I have not been able to find any record of this species in the Yorkshire fungus lists.—T. Petch, Hedon, Hull, 21st January 1901.

***Pleurotus ostreatus* at Horsforth.**—A form of this fungus grows luxuriantly every autumn upon the trunk of a dead poplar in my grounds at Horsforth, and has been kindly determined for me by Mr. Charles Crossland.

With age, this species attains a good size, and becomes of an intense blue-black above, though retaining the delicate whiteness of the gills beneath.

Though its near relative *Pleurotus euosmus* is not safe eating, this species is said to be edible by some authors, and Mr. H. G. Brierley, of Huddersfield, who has tried it, affirms that it makes an excellent and appetising dish when stewed with butter.—John W. Taylor, North Grange, Horsforth, Leeds, 29th December 1900.

Bird's-Nest Fungus at Hull Docks.—This peculiar little fungus (*Cyathus vernicosus* DC.) was seen by Mr. C. Waterfall in immense numbers at Hull last October. It was growing on dock sweepings in closely packed clusters, springing from a wide-spreading bed of mycelium, in the West Dock Reservation. The peridium takes the shape of a miniature bird's-nest containing six to ten, or even a dozen peridiolæ ('eggs'). It is fairly common, but usually not in such great quantity as observed by Mr. Waterfall.

The writer will be pleased to receive fungi of any kind for examination from any part of Yorkshire. The forwarding of specimens, accurately located, will materially help to work out the distribution of the members of this much neglected, yet most important, branch of British botany.—C. Crossland, Halifax, 1st November 1900.

Fairy Rings.—Is not the green and vigorous grass forming the rings produced by the decay of fungi of the previous year acting as manure? *Psalliota arvensis* and *Tricholoma gambosus* have a tendency to grow in rings, as well as *Marasmius oreades,* and the poorness of the grass *inside* the ring seems to me to be caused by the exhaustion of the soil consequent on the growth of the mycelium of the fungi of former years. The spores falling on the *outside* of the ring (as well as the mycelium) have obviously a better chance of developing on new ground than on that which has already borne a crop, hence the increase in the size of the rings. The incompleteness of the circle (where it occurs) must be owing to the unsuitability of the soil where the gaps occur, to the outward spread of the mycelium.

Will someone living where any of the above-named fungi are plentiful gather some next season, and leave them to decay on a grass plot, marking the place and observing the effect? I shall be much surprised if a strong contrast be not observable the following year between the thus manured and the surrounding grass. It would be well also, as Mr. Crossland suggests, to measure the diameter of the rings in each succeeding year, and thus find out to what extent they increase.

So far as my experience goes *Psalliota arvensis* and *Tricholoma gambosus* occur in pastures and *Marasmius oreades,* as a rule, on poor sandy land, such as that on heaths and commons.—W. Fowler, Liversedge, 5th Jan. 1901.

Naturalist,

LINCOLNSHIRE NATURALISTS AT LITTLE BYTHAM.

HENRY PRESTON, F.G.S.,

Hawthornden Villa, Grantham; Geological Secretary to the Lincolnshire Naturalists' Union.

FAVOURED with delightful weather, the Lincolnshire Naturalists' Union met at Little Bytham, on 17th July last, to hold their 26th Field Meeting. The locality is particularly rich in its flora, even for Lincolnshire, and, as a good series of rock sections in the Lower Oolites were also to be seen, the excursion promised to be a very interesting one.

Upon arrival at Little Bytham the party was divided into two sections, a number of naturalists accompanying the Rev. W. Fowler to Careby Wood, whilst the remainder, including geologists and entomologists, as well as botanists, worked the railway cuttings and Grimsthorpe Park. The disused railway, which formed one of the attractions of the day, was constructed to connect Edenham with Little Bytham, but was abandoned about forty years ago, and has become a happy hunting ground for naturalists ever since. This old line is interesting geologically, its direction being across the outcrop of the various beds of the Great and Inferior Oolites. Commencing in the Lincolnshire Limestone at Bytham, it crosses the Upper Estuarine Clay, Great Oolite Limestone, Great Oolite Clay, Cornbrash, and Oxford Clay, which repeat themselves several times in its short length of four miles in consequence of the folding of the strata. The physical features also of Grimsthorpe Park are well worth noting. The greater part of the ground is occupied by an outlier of Cornbrash, much obscured by drift. Where the drift, however, has been denuded, the various escarpments of the outcropping beds, with their gradual slopes, form interesting features in the landscape, beautifully illustrating the terraced form of hill scenery due to gently dipping beds of alternating hard and soft rocks.

The first stop was made on the Midland railway cutting, where a fine section of the Great Oolite Limestone was seen overlaid by Boulder Clay. The bed was examined for its fossils, and it was here that the position of the rocks was explained in relation to the various sections seen by the Union on previous excursions.

1901 February 1.

The solid geology of South Lincolnshire embraces the whole of the rock formations between the Rhætic beds and the Oxford Clay, all of which had been seen on previous occasions, with the exception of those lying above the Upper Estuarine Clays, and these were now to be examined. In the cutting an upper bed of the Great Oolite Limestone was found to be made up almost entirely of small Oyster shells, *Ostrea sowerbyi* and *O. subrugulosa*, which were freely collected.

Mr. Preston exhibited a number of Oxford Clay Ammonites which he had collected from the Boulder Clay when the Midland line was being made, just at its crossing with the disused railway. Amongst these, Mr. Keeping, of the Cambridge Woodwardian

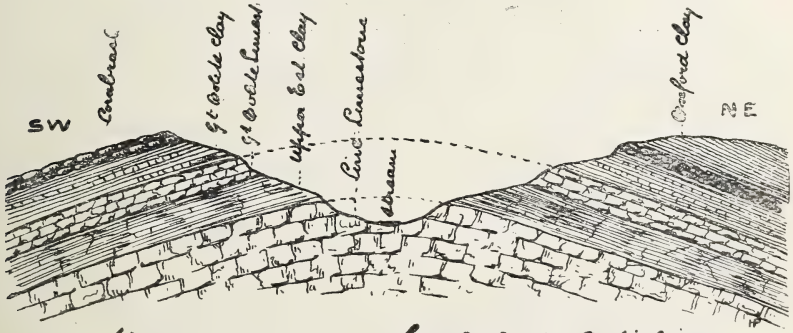
Section of Great Oolite Series in Midland Railway Cutting, Little Bytham.

Museum, had identified *Ammonites eugenii, A. dentatus, A. jason, A. mariæ,* and *A. cordatus.* Much interest was manifested in examining a fault in the Great Oolites near this crossing of the two railways, which could not be seen until the new line was being made a few years ago, because of the overlying Boulder Clay. The fault is a normal one, strikes approximately N.E. and S.W., and has a downthrow to the S.E. of about seven feet.

Passing next along the old railway, some good sections of Cornbrash were seen and examined, and several of the type

fossils, including *Ostrea marshii* (Sow.) and *Am. macrocephalus*, were obtained.

The Scottlethorpe Anticline is crossed about 1¼ miles from the Edenham end of this line, and a small stream has cut out its valley into the Lincolnshire Limestone. On its north slope escarpments occur of Estuarine Clays, Great Oolite Limestone, Great Oolite Clays, and Cornbrash, all dipping to the N.E., whilst the same beds crop out on the south bank and dip to the S.W. The Scottlethorpe Anticline, and the small but very distinct fault seen in the Great Oolites, gave some idea of the extent to which these rocks have been folded and broken by underground forces, and the position of the stream flowing along what was the crest of the anticline, with the flanking escarpments, enable us to picture something of the extent of denudation which has taken place.



Sketch Section across Scottlethorpe Anticline

Several good pits in Lincolnshire Limestone were visited in Grimsthorpe Park, but very little time could be spent there owing to the slow progress which had been made along the old railway. Had time permitted, it was the general opinion that much more good work by the various naturalists would have been done. The day went all too quickly, and Grimsthorpe Park, with its woods and marshes, as well as its pits, had to be passed over rapidly. Carriages were in waiting near the ruins of St. Mary's Abbey to convey the party through the park—a luxury many tired collectors fully appreciated—to the Little Bytham Rectory, where the Rev. and Mrs. Giles had most generously provided an excellent tea on the lawn.

Reports from the various leaders of sections were afterwards submitted, which have since been revised, and all tend to show a most successful day.

1901 February 1.

The Rev. E. Adrian Woodruffe Peacock, F.L.S., reports that Little Bytham lies in a rich floral neighbourhood, instinct with memories of long past workers. This meeting was specially arranged to re-discover, if possible, *Iris fœtidissima* and *Melampyrum cristatum*. The latter was taken after being sought in vain for eight years; the former still remains to be found, or is perhaps extinct now, though there is the Rev. W. Fowler's specimen in the British Museum. From the full lists of the Careby Wood species, supplied by Miss S. C. Stow and Mr. J. S. Sneath, and my own notes from the abandoned railway and Grimsthorpe Park, I make the following selection:—

Coronopus Ruellii.
Silene noctiflora.
Malva moschata and its flore albo form.
Oxalis acetosella.
Saxifraga tridactylites.
Caucalis nodosa.
Galium mollugo.
Galium palustre.
Asperula odorata.
Scabiosa columbaria.
Campanula glomerata.
Campanula Trachelium.
Specularia hybrida.
Anagallis pallida.
Anagallis cærulea.
Erythræa centaurium made the Saxby and Bourne railway cutting a lovely pink. Some specimens in Careby Wood were nearly a foot high, others barely two inches, but in flower.
Symphytum officinale.
Lithospermum officinale.
Linaria elatine.
Linaria spuria.
Linaria viscida.
Melampyrum cristatum.
Calamintha clinopodium.
Galeopsis Ladanum.
Atriplex hastata.
Daphne Laureola.
Viscum album. In huge masses in the park.
Euphorbia amygdaloides.
Melica uniflora.
Hordeum sylvaticum.
Blackstonia perfoliata.
Atropa Belladonna.
Cynoglossum officinale.
Verbascum Thapsus.
Astragalus glycyphyllus.
Vicia tetrasperma.
Solanum Dulcamara.
Solanum nigrum.
Marrubium vulgare.
Carex divulsa.
Calamagrostis epigejos.
Phleum nodosum.

Miss S. C. Stow furnishes the following list of Mosses, Hepatics, etc., taken at Careby Wood:—

Catherinea undulata W.&M.
Polytrichum commune L.
Fissidens taxifolius Hedw.
Orthotrichum Lyellii H.&T.
Mnium undulatum L.
Mnium hornum L.
Neckera complanata Hübn.
Homalia trichomanoides Brid.
Porotrichum alopecurum Mitt.
Thuidium tamariscinum B.&S.
Brachythecium rutabulum B.&S.
Brachythecium purum Dixon.
Eurhynchium crassinervium B.&S.
Eurhynchium prælongum B.&S.
Eurhynchium Swartzii Hobk.
Plagiothecium denticulatum B.&S.
Amblystegium serpens B.&S.
Hypnum cupressiforme L.
Hypnum cuspidatum L.
Hylocomium squarrosum B.&S.
Hylocomium triquetrum B.&S.

HEPATICS.

Frullania dilatata L.
Lophocolea bidentata L.

LICHEN.

Peltigera canina.

Miss Stow also reports the following Mosses from walls in Careby Village:—

Grimmia pulvinata Sm.
Tortula muralis Hedw.
Tortula intermedia Berk.
Barbula lurida Ldb.
Barbula fallax Hedw.
Webera nutans Hedw.
Bryum capillare L.
Pleuropus sericeus Dixon.

The Rev. Alfred Thornley, F.L.S., F.E.S., reported that, owing to the distance to be traversed, there was little time for stopping by the way, consequently the entomological resources of this most promising district could only be sampled here and there. The insects seen and taken were few, and no doubt this result was owing in some measure to the long cold spring. Nevertheless, at least a couple of the insects taken were remarkable. A splendid Syrphid fly, *Callicera ænea*, a great rarity in this country, was found at rest in a lane and captured. An interesting bug, *Podops inunctus*, hitherto having only a South Coast distribution, turned up. The following is the list of species seen, as far as he knows:—

LEPIDOPTERA.

Pieris brassicæ (Large White).
Pieris rapæ (Small White).
Vanessa urticæ (Tortoiseshell).
Epinephele janira (Meadow Brown).
Epinephele tithonus (Gate Keeper).
Epinephele hyperanthus (Ringlet).
Cœnonympha pamphilus (Small Heath).
Lycæna icarus (Common Blue).
Acidalia osseata (dilutata).
Cidaria associata.
Hemithea strigata (thymiaria).

DIPTERA.

Callicera ænea. A great rarity. (Rev. A. Thornley.)
Therioplectes tropicus. (Found by J. E. Mason.)
Volucella bombylans, and some very common Syrphidæ.

ORTHOPTERA.

In this group many species were still immature.
Stenobothrus bicolor. A common Grasshopper which is reputed to have the power of assimilating its coloration to that of the ground on which it lives.
Leptophyes punctatissima. A green Locustid; the organs of flight seem always to be in a rudimentary condition, at least in Great Britain. (Found by Mr. Stow.)

HEMIPTERA.

Podops inunctus. This was a remarkable find by Mr. Worsdale. The insect is not uncommon in the Southern Counties of England; particularly on or near the coast.
Megalocærea longicornis. Common.
Aphrophora alni.

COLEOPTERA.

Very few were either seen or taken, there being no time to stop and work; which was a pity.
Sphæroderma cardui is perhaps the only species worth mentioning.

Though this report is very meagre, nevertheless the outing, from an entomological point of view, must be regarded as a great success, if only by the discovery of the two interesting insects mentioned above.

Mr. J. Eardley Mason notes the following:—

HEMIPTERA-HETEROPTERA.

Dictyonota strichnocera Fieb. Abundant on Furze (Ulex europæus).

Phytocoris ulmi L. Some on Elm (Ulmus montanus).

Phylus melanocephalus L. On Oak (Quercus sp.).

Psallus lepidus Fieb. Many on Ash (Fraxinus excelsior).

Psallus alnicola D. & S. A few on Sallow (Salix sp.).

The lateness of the season was evidenced by the numerous immature individuals, not only of the above, but of many more species.

In Economic Entomology and Botany no damage was noticed by Mr. Mason either to corn crops or to roots.

Mr. W. Denison Roebuck, F.L.S., who had endeavoured to collect Molluscs, but from the brilliantly sunny weather without much success, noted that *Helix cantiana, H. virgata,* and *H. caperata* were very abundant on made ground by the railway bridges near Castle Bytham, at which village *H. aspersa*, *Agriolimax agrestis,* etc., were common.

NOTE on LINCOLNSHIRE ARACHNIDA.

***Phalangidæ* near Grimsby.**—The following species have been taken in the Grimsby district during the present year:—

Liobunum rotundum.
Liobunum blackwallii.
Phalangium opilio.
Phalangium parietinum.
Phalangium saxatile.
**Phalangium cornutum.*
Platybunus corniger.
Oligolophus morio.
Nemastoma lugubre.
**Nemastoma bimaculatum.*

Those marked (*) are additions to the Lincolnshire list published.—ARTHUR SMITH, 24, Peak's Field Avenue, Grimsby, 20th October 1900.

NOTE on LINCOLNSHIRE HEMIPTERA.

Hemiptera Collected in Lincolnshire in 1900.—In the Gainsborough district, presumably Div. 5 W., by Mr. F. M. Burton, F.L.S., et fils:—

Typhlocyba nitidula.
Typhlocyba quercûs.
Typhlocyba pulchellus.
Typhlocyba ulmi.
Eupteryx aurata.
Eupteryx vittatus.
Phytocoris ulmi.

At Bottesford, Div. 2 S., by Mr. Max Peacock:—

Miris lævigatus.
Philænus spumarius.

At Toynton All Saints, Div. 10 S., by the Rev. W. W. Mason:—

Cixius nervosus.

I have seen and can vouch for the specific determinations of all these insects.—ALFRED THORNLEY, South Leverton, 5th January 1901.

NOTE on LINCOLNSHIRE ORTHOPTERA.

Orthoptera taken at Bottesford in 1900.—Mr. Max Peacock has submitted to me the following to record for Div. 2 S.:—

Periplaneta orientalis. *Stenobothrus bicolor.* ♂.
Forficula auricularia.

—Alfred Thornley, South Leverton, 5th January 1901.

NOTES on HYMENOPTERA.

***Sirex gigas* at Northwich, Cheshire.**—In August this year, a very fine female specimen of this insect was brought to me for identification; it was caught in the town of Northwich that afternoon.—B. R. Lucas, 3, Dyer Terrace, Winnington, Northwich, 2nd November 1900.

Nest of *Vespa germanica* near Grantham.—In August last I dug up a Wasp's nest and counted the wasps and grubs it contained. It was a very small nest, but the only one I could find just then. It contained no less than 230 wasps, 742 celled cells and nearly full-grown grubs, one queen, and a number of very small grubs and eggs; the nest was of a greyish colour and in four tiers, the two largest measuring 3½ inches across. The wasps were killed by turpentine, which was squirted in at the entrance of the nest, the hole then being stopped with clay.—S. C. Stow, Court Leys, Brandon, Grantham, 23rd November 1900.

Hymenoptera Captured during 1900 in Lincolnshire. — The following were taken in Bottesford parish, Div. 2 S., by Mr. Max Peacock:—

Bombus venustus. ♀.
Bombus agrarum. ♀.
Andrena nigroænea. ♂ (stylopised, and so like the ♀).
Andrena gwynana. Two ♀s.
Fornica fusca. Two ♀s and one ☿.

At Ludborough, Div. 8 N., the following was taken by the Rev. W. W. Mason:—*Crabro cephalotes.* ♀.

At Manton Common, Div. 2 S., Mr. Max Peacock took *Pompilus plumbeus.*—Alfred Thornley, South Leverton, 5th January 1901.

Hymenoptera taken at Skegness in 1900.—The following species of Aculeate Hymenoptera, taken at Skegness this season by Prof. J. W. Carr, M.A., F.L.S., of Nottingham, have all been seen and identified by myself:—

Megachile circumcincta. Seven ♀s and eight ♂s, 30th June 1900.
Andrena nigroænea. One ♀, 30th June 1900.
Andrena nana. ♀, 21st July 1900.
Andrena albicrus. Two ♀s, 18th July 1900.
Halictus rubicundus. ♀, 18th and 23rd July 1900.
Halictus morio. ♀, 18th July 1900.
Sphecodes subquadratus. ♀, 18th July 1900.
Prosopis communis. ♂, 18th July 1900.
Prosopis brevicornis. ♀, 23rd July 1900.
Cœlioxys simplex. Five ♀s and three ♂s, 30th June 1900.
Crabro peltarius. ♂, 30th June, and ♀, 18th July 1900.
Crabro wesmäeli. ♀, 30th June 1900.
Tachytes pectinipes. ♂ and ♀, 30th June 1900.
Tachytes unicolor Panz. ♀, 30th June 1900.
Oxybelus uniglumis. Six examples, 30th June and 21st July 1900.
Pompilus plumbeus. Thirty examples, 18th and 30th June 1900.
Pompilus gibbus. ♂ and ♀, 30th June and 18th July 1900.
Pompilus rufipes. One example, 18th July 1900.
Astata stigma. One ♂, 30th June 1900.

One Tenthredinid was also taken by Prof. Carr, viz.:—*Selandria serva*, ♂, 23rd July 1900.—Alfred Thornley, South Leverton, Notts., 5th January 1901.

NOTE on LINCOLNSHIRE NEUROPTERA.

***Sympetrum striolatum* at Manton Common.**—A female taken at Manton Common in 1900 by Mr. Max Peacock has been submitted to me for identification and record.—ALFRED THORNLEY, South Leverton, 5th Jan. 1901.

NOTE on CUMBERLAND TRICHOPTERA.

Cumberland Trichoptera.—Mr. William Hewett, of York, recently gave me several trichoptera, taken by Mr. J. E. Thwaytes in Cumberland, and which, on account of the county, it may be as well to place on record:—

Limnophilus sparsus. Bolton Fells.
Limnophilus stigma. Newby Cross.
Stenophylax concentricus. Newby Cross.
Halesus radiatus. Carlisle.
Rhyacophila dorsalis. Carlisle.

—GEO. T. PORRITT, Crosland Hall, near Huddersfield, 5th January 1901.

NOTE on LINCOLNSHIRE COLEOPTERA.

Coleopterous Captures in Lincolnshire in 1900.—The following were taken in the Gainsborough neighbourhood, presumably in Div. 5 W., by Mr. F. M. Burton, F.L.S., and his son:—

Notiophilus biguttatus. *Coccinella decempunctata* (*variabilis*).

At Toynton All Saints, Div. 10 S., the Rev. W. W. Mason took the following:—

Calathus cisteloides. *Amara apricaria.*
Harpalus ruficornis.

The following, collected on Manton Common, Div. 2 S., by Mr. Max Peacock, were sent to me in November:—

Aphodius scybalarius. Two.
Aphodius inguinatus. Several.
Aphodius prodromus. One.
Necrophorus ruspator.
Ocypus olens.
Philonthus politus.
Philonthus laminatus.

The following were all collected at Bottesford, Div. 2 S., by Mr. Max Peacock:—

Pterostichus vulgaris. ♀.
Pterostichus madidus. Five ♀s.
Harpalus ruficornis. Two ♂s and one ♀.
Harpalus rufibarbis. ♀.
Nebria brevicollis. Two ♀s.
Calathus cisteloides. ♂.
Anchomenus dorsalis. Four.
Trechus minutus. One.
Badister bipustulatus. One.
Amara familiaris. Four.
Amara plebeia. One ♂.
Melanotus rufipes. One.
Agriotes obscurus. Four.
Barynotus obscurus. One.
Silpha atrata. One.
Apion humile. One.
Serica brunnea. One.
Otiorrhynchus picipes. Two.
Phyllobius pyri. One.
Sitones lineatus. Several.
Apion dichröum. ♀.
Cassida flaveola. One.
Phœdon tumidulum. Eight.
Philonthus politus. Two.
Gastrophysa polygoni. ♂.
Stenus speculator. One.
Epurœa æstiva. Four.
Ragonycha limbata. Three.
Aphodius ater. One.
Anaspis melanopa. Several.
Meligethes viridis. Several.
Phyllotreta nemorum. Several.
Psylliodes picina. One.
Stilbus testaceus. One.
Anthrenus claviger. One.

All these insects have been seen and determined by myself, and the notes will serve as authenticated material for the use of future workers.—ALFRED THORNLEY, South Leverton Vicarage, 5th January 1901.

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Mammals of Bottesford Parish.—Max Peacock.

Yorkshire Bryological Report for 1900.—J. J. Marshall.

The Pollard Willow, Bottesford.—Max Peacock.

Lincolnshire Naturalists at Mablethorpe.—R. W. Goulding.

Pairing of Limax maximus (Illustrated).—H. Wallis Kew, F.Z.S.

Cumberland Botanical Notes for 1900.—Wm. Hodgson, A.L.S.

Mosses New to South or to North Lincolnshire.—Miss S. C. Stow.

Yorkshire Lepidoptera in 1900.—Wm. Hewett.

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THE NATURALIST:

A

MONTHLY JOURNAL OF

NATURAL HISTORY FOR THE NORTH OF ENGLAND.

EDITED BY

WM. DENISON ROEBUCK, F.L.S.,

259, Hyde Park Road, Leeds;

WITH THE ASSISTANCE IN SPECIAL DEPARTMENTS OF

J. GILBERT BAKER, F.R.S., F.L.S.,

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BRITISH MUSEUM NATURAL HISTORY

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CAPITALISATION OF SPECIFIC NAMES.—Hitherto the rule of 'The Naturalist' has been the Zoological one, that specific names shall invariably commence with a small letter, never with capitals. Henceforth this rule will still apply to all Zoological names, but in deference to the wishes of our botanical contributors the specific names of plants will conform in this respect to the standard catalogue or monograph in each branch of botany.

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Yn Lioar Manninagh.—Vol. 2, for 1892-1895, publ. 30th Jan. 1901. [Isle of Man N.H.S.

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YORKSHIRE BRYOLOGICAL COMMITTEE: REPORT FOR 1900.

J. J. MARSHALL,
Beverley; Convener of the Yorkshire Bryological Committee.

THE following is the Report of the Yorkshire Bryological Committee for the year 1900:—Bryologists have again a very interesting lot of discoveries and new records to announce, and again the best work has been done by individuals on their usual rambles. Only two reports of work done at the Union's meetings during the year have been sent in.

Mr. Charles Crossland, F.L.S., forwarded a list of about thirty Mosses and Hepatics from the Skipsea and Hornsea district, which are, however, all commonly distributed.

Mr. W. Ingham has published in the October number of 'The Naturalist' a good and extensive list of the Moss-flora of Arkengarthdale, including many varieties. He also forwards a list with several additions to the Yorkshire flora.

Mr. G. B. Savery, a new worker, also adds a *Grimmia* to the list.

Mr. J. F. Robinson reports an addition to the East Riding list, and your Secretary several more, one of which, a *Dicranum*, awaits identification. Mr. Robinson has also found in the East Riding *Selaginella selaginoides*, a very uncommon plant in the district.

Mr. James Needham sends a good selection gathered in the Hebden Bridge neighbourhood.

Mosses reported for the year 1900:—

Grimmia obtusa (Sm.) Lindb. Near Almias Cliff; G. B. Savery.

Bryum turbinatum Hedw. Newbald Springs, near Hull; J. F. Robinson.

Mr. James Needham, of Hebden Bridge, has sent the following Mosses; all of them collected near Hebden Bridge, South-West Yorkshire.

Webera albicans Wahl. In fruit. High Greenwood.

Hypnum stramineum Dicks. In fruit. Hebden Valley.

Hypnum uncinatum Hedw. Pecket Wood.

VAR. ***plumulosum*** B.&S. Pecket Wood.

VAR. ***plumosum*** Schpr. In fruit. Hardcastle.

Hypnum ochraceum Turn. var. ***flaccidum*** Milde. In fruit. Outwood, Crimsworth Dean.

Brachythecium rivulare B.&S. var. ***cataractarum*** (Gauter). In fruit. River Hebden.

Hypnum rusciforme Neck. var. ***atlanticum*** (Brid.). In fruit. River Hebden.

Heterocladium heteropterum B.&S. In fruit. Hebden Valley.

Hyocomium flagellare B.&S. In fruit. River Hebden.

Mr. J. J. Marshall sends the following, which were collected near Beverley.

Tortula angustata Wils. Swinemoor, Beverley. New to the East Riding.

Fissidens tamarindifolius Don. Swinemoor, Beverley. New to the East Riding.

Fissidens exiguus Sull. Westwood, Beverley. New to the East Riding.

Dicranum? Westwood, Beverley.

Leskea polycarpa Ehrh. var. ***paludosa*** Wils. The Pulfin, banks of river Hull.

Pleuridium alternifolium B.&S. Swinemoor, Beverley.

Mr. William Ingham, B.A., sent the following :—

Mollia æruginosa (Sm.) Lindb. var. ***affinis*** Ingh. Falcon Clints, co. Durham. See J. of Bot., July 1900.

Mollia æruginosa (Sm.) Lindb. var. ***humilis*** Ingh. Kilhope Burn, Weardale, co. Durham. See J. of Bot., Dec. 1900.

Cinclidotus fontinaloides Hedw. var. ***pseudo-aquaticus*** Ingh. Near Hardraw Scaur. See J. of Bot., December 1900.

Mr. Ingham's list of Arkengarthdale Mosses was published in the October number of 'The Naturalist.' He also sends the following :—

Grimmia montana Br.&S. Reeth, Arkengarthdale. New to Yorkshire.

Hypnum fluitans Hedw. var. ***Jeanbernati.*** Skipwith Common.

Mollia tortilis Schwgr. Jackdaw Crag Quarry.

Hypnum pallidirostre A. Braun. Jackdaw Crag Quarry.

Hypnum speciosum Brid. Barkstone.

Barbula sinuosa Wils. Jackdaw Crag Quarry.

Funaria hygrometrica L. var. ***calvescens*** Schw. Naburn. New to East Riding.

Hypnum pratense Koch. Strensall. New to Yorkshire.

Mr. Ingham has also reported the following Hepatics:—

Aneura latifrons Lindb. Knottingley.

Reboulia hemisphærica (Raddi) L. Jackdaw Crag Quarry.

Fossombronia cristata Lindb. By the Foss. New to Yorkshire.

Jungermannia porphyroleuca Nees. Kirkham Abbey.

Jungermannia incisa Schrad. Arncliffe Wood.

Cephalozia lunulæfolia Dum. Arncliffe Wood.

Cephalozia stellulifera Tayl.MS. In fruit. Barmby Moor, August 1900. For description see Pearson's Hepat. Br. Isles, Part 10.

Scapania intermedia Husnot. Arncliffe Wood.

Scapania subalpina (Nees) Dum. Burnhope Burn, Weardale, co. Durham. New to England.

LIST OF MOSSES
NEW TO NORTH OR TO SOUTH LINCOLNSHIRE.

Miss S. C. STOW.
Court Leys, Brandon, Grantham.

The following short list of Mosses which have been lately discovered in Lincolnshire, contains everything new since the publication of my paper in 'The Naturalist,' February 1900, pp. 45-48. Two species have not been taken before in North Lincs. 54, and fifteen are fresh records for South Lincs. 53.

I wish to thank the Rev. W. W. Mason and others, who have helped in collecting and naming the species; and trust that other workers will take up the pleasant out-of-door recreation of collecting, and forward their specimens to me.

Dicranoweisia cirrata Ldb. S. Div. 13. Mere, 1899, Rev. W. W. Mason.

Fissidens pusillus Wils. S. Div. 15. Brandon, 1900, S. C. Stow.

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Fissidens incurvus Starke. N. Div. 6. Stow, 1899, S. C. Stow. S. Div. 14. Cranwell, 1899, S. C. Stow.

Funaria hygrometrica Sibth. var. ***calvescens*** B.&S. S. Div. 15. Sapperton, 1900, S. C. Stow.

Philonotis fontana Brid. S. Div. 16. Deeping St. James, 1899, Rev. W. W. Mason.

Bryum pallens Sw. S. Div. 16. Deeping St. James, 1899, Rev. W. W. Mason.

Bryum bimum Schreb. S. Div. 16. Deeping St. James, 1899, Rev. W. W. Mason.

Bryum argenteum L. var. ***lanatum*** B.&S. S. Div. 15. Sapperton, 1900, S. C. Stow.

Brachythecium salebrosum B.&S. S. Div. 15. Brandon, 1900, S. C. Stow.

Brachythecium rutabulum var. ***majus.*** S. Div. 16. Deeping St. James, 1899, Rev. W. W. Mason.

Amblystegium filicinum DeNot. var. ***Vallisclausæ*** Dixon. N. Div. 8. Louth, 1900, Rev. W. W. Mason. S. Div. 15. Sapperton, 1900, S. C. Stow.

Hypnum riparium L. var. ***longifolium*** Schp. S. Div. 14. Cranwell, 1900, S. C. Stow.

Hypnum Sommerfeltii Myr. S. Div. 15. Sapperton, 1900, S. C. Stow.

Hypnum cupressiforme L. var. ***resupinatum*** Schp. S. Div. 15. Brandon, 1900, S. C. Stow. S. Div. 14. Cranwell, 1900, S. C. Stow.

Hypnum cuspidatum L. var. ***cæspiticium*** Whiteh. S. Div. 16. Deeping St. James, 1899, Rev. W. W. Mason.

NOTE on LINCOLNSHIRE MOSSES.

Some Mosses at Sapperton, Lincolnshire.—The following extract is out of a letter from Miss S. C. Stow, of Court Leys, Brandon, Grantham, dated 1st November 1900:—'At Sapperton, Div. 15, I made a lot of notes on mosses, and saw altogether more than fifty species. One is new to Lincolnshire, *Hypnum Sommerfeltii*. There are also two new varieties which I have not seen in the county before, namely, *Bryum argenteum* var. *lanatus* and *Funaria hygrometrica* var. *calvescens*. I have not yet had time fully to examine all the specimens I brought home, and something good may yet turn up among them. A mud-capped wall, where I took some good specimens in 1899, has now been tiled over, and I could not find a vestige of its former species anywhere.'—E. Adrian Woodruffe Peacock, Cadney, Brigg, 8th December 1900.

THE FACIES OF OUR FOREST FLORA.

P. Q. KEEGAN, LL.D.,
Patterdale, Westmorland.

By those who perpetually reside in temperate climes the characteristic facies, so to speak, of our sylvan scenery is not fully appreciated; that is to say, it is not sufficiently considered or envisaged as to its special scientific aspects and meaning. The very familiarity of the ordinary appearance of our native and denizen trees and shrubs induces a practical ignorance or rather, perhaps, an unconscious ignoring of the actual and efficient causes and agencies which have served to bring it about. When, for example, we compare the huge leaves, evergreen as a rule, of some of the conspicuous types of tropical vegetation with the tiny foliaged and deciduous clothing of our forests, we must needs be led to suppose or conclude that some powerful agency is operative to produce effects so diametrically opposite. What this special agency is, it is now our purpose to specifically demonstrate.

The effects of the intensity, brightness, refrangibility, and colour of the solar radiance have been pretty thoroughly studied and examined as regards their respective influences on the vegetation of a district in general or on that of a certain species of plant in particular. One thing, however, is absolutely certain, viz., that the differences between the tropics, where a very high and approximately equal intensity of light prevails all the year round, and our own temperate zone, where the light is never very intense and is decidedly intermittent, have superinduced distinctive characters on the plants submitted to these two conditions of illumination respectively. These characters are exhibited in the general umbrageousness or otherwise of the foliage, the ramification, the spray, the number of buds that burst their cerements or remain dormant, the number of branches and leaves annually produced, and, above all, the comparative size and configuration of those leaves. The most pregnant consideration is this. On superficial contemplation it might be imagined that the trees growing in the tropics, being evergreen and therefore deprived of a periodical winter rest, enjoy a longer time and more favourable conditions for the development of shoots both terminal and lateral, than do the trees of temperate latitudes. In order, however, that a shoot

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be formed it is necessary that its rudiment, i.e., its bud, should precede it, and on the supposition that the vital energy of the tree has been previously expended very exhaustively on the formation of some other organ, a very large leaf for instance, then there might not be sufficient left over to bring about the creation of a bud. In fact, moreover, a bud is in some respects a storehouse of reserve materials, and the elements in its immediate vicinity are specially rich in protoplasm, starch, etc. Hence if the tree is capable of building many buds at any time, it must have plenty and to spare of those materials which are most conducive to the sustenance of its life energy; but this can hardly be the case if, as in the tropics, its energies are always on the move, so to speak. It cannot under these circumstances 'burn the candle at both ends'; that is to say, it cannot possibly exert a tremendous previous energy in the formation and rapid growth of a very large leaf and at the same time lay by and hold over the requisite amount of similar energy incident to the creation of a well-magazined bud, or a thoroughly matured seed.

At the Equator, as has been said, a plant is always in a forcing-house; it runs all to leaf and rarely matures its seed. Even at Honolulu, in latitude 21 N., banana leaves grow on an average four or four and a half inches per day, and ultimately attain a length of ten feet in some cases. It is useless to multiply instances; at all events, we understand now that in comparison with the number of the leaves in tropical trees a smaller number of buds is formed in their axils, and hence the number of side branches is greatly restricted. Tropical trees form fewer lateral shoots and branches than ours do; sometimes, indeed, none are formed at all. As Wiesner says, 'the larger the leaves of a tree are, so much the less possible, but also so much the less necessary, is the branching of the stem.'

With the foregoing facts and deductions under review, let us now endeavour to catch and appreciate the distinctive characteristics of our own widely-familiar forest and woodland vegetation. There is nothing monotonous or stereotyped about it: the salient feature is its umbrageousness. No doubt the foliage of our most picturesque trees presents breaks and hollows, but the Sycamore, the Lime, Horse Chestnut, Elm, Beech, etc., throw out for the most part a grand unbroken mass, an umbrageous and thickly-clothed head in no way monotonous, but bristling and waving with apparently serried ranks of separate and individual component parts. But what is

this multum in parvo due to? Whence all this massy concentration of slender boughs and miniature shoots, of small and deeply-divided foliar organs?

Let me endeavour to explain. Roughly, the number of shoots and twigs that appear upon a tree is dependent on the number of buds that burst and evolve to maturity. In all cases a great many more buds are raised than what ever actually do develop. In the axils of our leaves two buds arise, of which the higher one in the upper and middle nodes of the branch commonly bursts and develops all right, while the lower one mostly remains latent. The feature to be elucidated is, therefore, the comparatively large number of buds that actually do burst and expand; because it is pretty evident, from what has been aforesaid, that the fewer of these organs that burst the less numerous is likely to be the leaves, and hence in our clime, with its infinity of small leaves, it is essential, in order to produce this latter effect, that a large number of buds be induced to unfold at the appropriate time, i.e., in spring. Of course and no doubt if all the buds produced and perfected in the previous summer and autumn were to evolve in the ensuing spring, the tree would die from exhaustion. A certain amount of restriction is therefore indispensable. For instance, a Beech of ten years old might have put forth only five branches, although its structural organisation would be quite capable of producing nine branches; or it might actually have thrown off only about three hundred shoots, whereas something over nineteen thousand would represent its native organic competency in this respect.

It is scarcely necessary to dwell at any length on the principal means and organic contrivances whereby this absolutely necessary restriction of the shoot-, twig-, and leaf-formation of our trees is brought about. Inasmuch, however, as this matter has been almost completely ignored by the professorial compilers of British botanical text-books, a mere enumeration may do no harm. The causes of the reduction and final extermination of shoots, then, are these:—(1) An insufficient illumination of the buds; (2) the capping of the twig by a flower-bud or a fruit-bud; (3) the decussate arrangement of twigs and leaves; (4) sympodial branching; (5) cracking and breaking off of branches already formed; (6) imperfect illumination of the spray. Of these we need only refer to the first and last, viz., the insufficient illumination of the buds and of the spray. It is evident that in the case of a large-leaved tropical tree the buds and portions of the branches which are seated beneath its

canopy will be poorly illuminated by the solar radiance, and hence will be checked in development. If side shoots happen to be formed under these circumstances the leaves which they carry will be obliged to unfold in the shade, and cannot therefore attain the full size and dimensions which they are capable of. In fact, their position will be similar to that frequently seen in some of our densely-clothed trees, where, even in June, small branches in the interior of the crown become completely leafless and even actually wither away, in this way gradually but surely bringing about a serious diminution of the total embranchment. This phenomenon is specially observable in well-grown Horse Chestnut, a native of the mountains of Tibet, one of the most sun-illumined portions of the earth. What the dense umbrageous canopy of leaves in certain of our specially favoured trees effects in the way of reduction of shoots and branches is effected much more expeditiously and permanently by the huge developments of the frondescence, especially characteristic of many well-known tropical and sub-tropical exotics, i.e., their comparatively large-sized leaves, by casting a bowery umbrage upon the buds, forbids and checks their normal development. Quite otherwise are the conditions under which our forests rejuvenate their foliage and wide-stretch their umbrageous arms—

> All weave on high a verdant roof,
> That keeps the very sun aloof,
> Making a twilight soft and green
> Within the column'd vaulted scene.

In order, however, that this impressive effect be produced, the comparative lowness of the intensity of sunlight in our latitudes necessitates (1) a fall of leaves in autumn; (2) a relatively small leaf. The shedding of the autumn leaves exposes the bare wintry boughs to the influx of the brilliant sunrays in the springtime, so stimulative to the dormant vital energies of the buds. It is evident that if the leaves did not fall the shadows cast by the crown, i.e., in its far-stretching and deeply-dissevered dome-like form, would so seriously interfere with the illumination of the interiorly situated buds and shoots, that their full and free development would be checked and they would gradually perish. Whence it would follow that the most characteristic and distinctive feature of our woodland scenery would be destroyed. In our very few evergreen trees on the other hand, the shadows that lower cannot be severe in the case of the Pines, whose foliage gradually disappears from base to summit of the stem, and in the Firs their pyramidal configura-

tion saves the situation, as thereby the too far removal of a certain number of the buds from the periphery of the crown, i.e., from the influence of light, is obviated. Now, just as the autumnal fall, or rather the vernal openness of the woods, allows of the formation of numerous twigs and a bold, discursive spray, so the comparative smallness of the blade acts as a complementary cause thereof. Small foliar organs in lavish number are best fitted to supply a thick and matted, dense and clustered canopy adequate to the clothing and investment of a far-stretching skeleton of twigs and branches. Being small, as I say, each individual leaf does not project a damaging amount of shade upon those lying underneath; there is always left between the screen an avenue for some startling, dazzling radiance to dart below and stimulate the vital energies of the organised items tenanting the darksome underwood. Moreover, as a rule the smaller the leaf the smaller the bud; and if the individual bud be small, the tree may be more competent to produce and perfect a greater number thereof—a precious provision indeed in the denizen of a cold climate where frosts and chilly blasts would work sad havoc with the watery juices that move in the tender tissues instinct with the fresh new life of germination.

NOTES on FLOWERING PLANTS and TREES.

Mildness of Season in Furness.—A handful of ripe Wild Strawberries (*Fragaria vesca*) was picked last week on the top of Scora Bank, on the road to Dalton-in-Furness, by Mr. David Huddleston, Parish Clerk of Dendron.—A. H. Humphris, Vicar of Dendron, 5th December 1900.

Some Remarkable Oak Trees in the North.—In the garden at the gas manager's house in Spalding there is an Oak (*Quercus robur*) that has a curious history. It was grown from an acorn sown in 1763 in the following circumstances: A gentleman named Massey had a brace of Pheasants given to him, and in the craw of one of them was found some acorns. Three were sown in a flower pot, one of which grew, and is now the Spalding Oak.

In Colwick Park, Notts, is a fine Burgundy Oak (*Quercus cerris*) bearing the following label:—'Planted to celebrate Lord Howe's victory on the 1st of June, 1794.'

Some years ago large specimens of the Red Oak (*Quercus rubra*) were felled in the park at Wentworth-Woodhouse. They were bought by a timber merchant in Sheffield for exportation to America.

Last spring, in making a tour in the poet Cowper's haunts, near Olney, Northamptonshire, I came in view of the largest and oldest Ash tree (*Fraxinus excelsior*) I had ever seen; so large that I hope the note herewith may be worth recording. It was full of leaf and had some enormous protuberances of overgrowth, especially near the roots. At three feet from the ground the trunk is by measurement 29 feet round. This tree stands in Weston Underwood Park, between the alcove and the highroad.—Henry Payne, Newhill Hall, West Melton, Rotherham, 2nd February 1901.

NOTES on BIRDS.

Buzzard at Askrigg.—At our bi-monthly meeting of the York and District Field Naturalists' Society, on Thursday, 13th February, Mr. Lazenby reported that a specimen of the Common Buzzard (*Buteo buteo*) had been sent to him. It was shot on Askrigg Moor on 24th August of last year.—T. Ainsworth Brode, York, 15th February 1901.

Nuthatch in Lower Swaledale.—As there has been a question as to the occurrence of the Nuthatch (*Sitta cæsia*) in the county of Durham, and as this place is only about 14 miles south of the border of that county, it may be of interest to note that the Nuthatch occurs here—but rarely. There is one about in the garden this winter, otherwise it is a long time since I have seen the bird here.—Beatrice Carpenter, Kiplin, Northallerton, 13th February 1901.

Winter Occurrence of House Martin at Redcar.—A House Martin (*Chelidon urbica*) appeared in front of The Cliffe on the 14th December, and was observed, at intervals, flying backwards and forwards, until the 20th December. On one or two days I saw it as late as 3.45 p.m. The weather was fine, with strong S.W. winds; on the 20th we had a strong gale, and since that time I have not seen the martin.—T. H. Nelson, The Cliffe, Redcar, 31st December 1900.

Tufted Duck near Northwich, Cheshire.—I received a male bird of this species (*Fuligula fuligula* L.), shot on the Mere, Clay Croft, Marbury, Northwich, during the week ending 19th January, by Mr. John Hindley. The specimen had been badly damaged by a dog, but was in breeding plumage. Mr. Hindley said in his letter they had not visited the Mere for many years, so I think it as well to send this record.—E. Adrian Woodruffe-Peacock, Cadney, Brigg, 22nd January 1901.

Birds Breeding in Bottesford Parish in 1887.—As short notes are wanted, it may perhaps be worth while recording that I find from my notebooks, which I am destroying, that the following birds bred in the parish (Div. 2) in 1887:—

Shelldduck.	Mallard.	Woodcock.
Snipe.	Teal.	Coot.
Redshank.	Shoveller.	Lesser Grebe.

—Max Peacock, Ivy House, Bottesford, Doncaster, 1st May 1900.

Wild Duck at Skipwith.—On 25th January, while Mr. Ingham and myself were gathering mosses on the Common, we were astonished at the large number of Wild Duck that were circling overhead. There must have been at least five hundred (Mr. Ingham thought more), and they had apparently risen from the ponds at our approach. Last year we noticed a large number there, and round one pond we found evidences of their presence in the dead and mutilated frogs which strewed the edge, but we never saw such a flight as this year.—T. Ainsworth Brode, York, 15th February 1901.

Nesting of Thrushes and Blackbirds in December.—Many years ago as I was passing through the village of Loftus-in-Cleveland, the Rector of that place stopped me in the street and asked me to go with him to see something which I might never see again during my lifetime. I went with him into a shrubbery surrounding the Rectory, and there in a holly bush, much to my surprise, I saw a Blackbird (*Turdus merula*)'s nest containing three young ones; that was I believe on the 24th December about thirty-five years ago. So far I have not seen the same, but something very nearly approaching I came across on Monday, 17th December 1900, in the neighbourhood of Pannal, viz., a Thrush (*T. musicus*)'s nest containing two eggs. The nest was amongst some briars, but sheltered by a whin bush, which grew behind and partly hung over it. The young Blackbirds before mentioned unfortunately were frozen to death only a few days after I saw them, and, to save the young which might possibly have been hatched from these Thrush's eggs from a similar fate, I thought it advisable to take the eggs.—K. McLean, Harrogate, 26th December 1900.

NOTES on BIRDS.

Swifts in Yaddlethorpe Gravel-pits, and other Bird-notes.—These birds (*Cypselus apus*) frequented the Yaddlethorpe gravel-pits, 5th June 1887; I had never noticed them do so before. One pair had a nest in a disused Sand-Martin's hole. They formerly built in the church tower and in the roofs of cottages at Ashby only. I have had eggs from Ashby from under the tiles of the house of the postmaster, Mr. James Kendal.

Kingfishers (*Alcedo ispida*) are abundant this year, and Hawfinches (*Coccothraustes vulgaris*) are getting quite common at Bottesford.—MAX PEACOCK, Ivy House, Bottesford, 4th May 1900.

Winter Nidification of Robin.—On the 14th inst. I had brought to me a Robin (*Erithacus rubecula*)'s nest with six eggs therein. It was taken at Hale Barn, near Altrincham, and was first observed by my friend on the 5th inst., and he saw the bird fly off, and it had then six eggs in. On that day a very severe frost set in, which lasted till the 9th inst., and, on further examination, the nest was found deserted. The eggs were frozen, and, although fresh, very difficult to blow. The nest was in a stable-wall behind a loosened brick. Is there any recorded instance of a Robin's nest with six eggs so early in the year as the 5th January, so far north?—F. H. TAYLOR, Birch Fold Cottage, Old Hall Lane, Failowfield, Manchester, 19th Jan. 1901.

Meaning of the Word Lapwing.—In Mr. Peacock's interesting paper on English bird-names in the February number of 'The Naturalist,' p. 46, there is a misconception as to the meaning of the name Lapwing applied to *Vanellus vanellus*. This word is the modern form of the Anglo-Saxon 'hleapewince,' in which there is no reference either to sound or to wing. 'Hleape,' from the Anglo-Saxon 'hleapan,' to run, refers to the flight or running of the bird; and 'wince' means a 'turner' or 'one who turns'; so that the whole name signifies 'he that turns about in running.' The modern word 'wing' was not known to the Saxons, our forefathers using the name 'fiðere' for wing, a word allied to 'feðer,' the modern 'feather.'—J. A. MARTINDALE, Staveley, Kendal, 2nd February 1901.

Shag in Cheshire.—On 5th February a specimen of the Shag (*Phalacrocorax graculus*) was found by our bailiff in the garden and brought in alive, in a starved condition, but in no way wounded. It was afterwards sent to Mr. Cutmore of the Derby Museum, Liverpool, who identified it as a female in mature plumage. It must have been driven inland by recent gales, though there had been no wind to speak of for some days previous to its capture.

In your issue of September 1900 Mr. W. H. Dobie, in a review of 'The Birds of Cheshire,' by Coward and Oldham, appeals for the publication of further observations for that county, and I send this note by his request, as he tells me it is the first record of the Shag he has been able to obtain.—C. R. T. CONGREVE, Burton Hall, Neston, Cheshire, 15th February 1901.

White Sparrows and Greenfinch in Holderness.—Several localities in Holderness are noted for the occasional appearance of White Sparrows (*Passer domesticus*). A specimen frequented Newton Garth, between Hedon and Paull, during the summer of 1900, being first observed in June. I saw it at the end of August. Its beak and legs were light horn-coloured, and the nape seemed somewhat ashy, though this may have been due to the dust in which the bird was vigorously endeavouring to hide its beauty. The other Sparrows displayed no signs of jealousy of their more fortunate (?) comrade.

A similar specimen, but with several brown feathers, occurred in the same locality in 1899. It was caught and caged in the autumn, but soon died. I have not yet learnt the fate of its successor.

Mr. Warley, of Hull, informs me that a cream-coloured Greenfinch (*Ligurinus chloris*) was seen at Skirlaugh (1900). As it was a young bird it was not shot 'on sight,' but allowed to live till after its first moult, in the hope that its plumage would become whiter. The change, however, was in the other direction; it became more cream coloured, though this did not save it from destruction.—T. PETCH, Hedon, Hull, 21st January 1901.

NOTE on MOLLUSCA and FISHES.

Frost and *Limnæa peregra*.—On the 7th January 1901 I found four living *Limnæa peregra* in a wooden bucket which had been used for filling a cattle trough from an adjacent drain, and had been left on the bank full of water. The ice in it, the result of four days' frost, was more than an inch in thickness. The most remarkable point was the position of the *Limnææ*. They had grouped themselves on one side, as far as possible from the effect of the keen easterly wind.

Nine Sticklebacks (*Gasterosteus aculeatus*) had shared their limited quarters but only the two largest were alive.—T. Petch, Hedon, Hull, 21st January 1901.

NOTE on HOLDERNESS BIRDS.

Holderness Bird Notes, Christmas 1900.—The most striking feature of bird life during Christmastide was the extraordinary abundance of our commoner migrants. Fieldfares (*Turdus pilaris*) and Redwings (*T. iliacus*) literally covered the taller hawthorn hedges, which fortunately had produced a record crop of haws. Near the coast, at Aldborough, Fieldfares were common, but there were no Redwings. Several of the latter succumbed to the slight frost of 3rd January.

The appearance of unusually large flocks of Golden Plover (*Charadrius pluvialis*) and Lapwing (*Vanellus vanellus*) induced several farmers near the Humber to add to their income by netting, which was not formerly practised in the district. In contrast it is pleasing to note that the farmers in the Lambwath area recognise the usefulness of the 'Green Plover,' and, though freely granting permission to shoot Duck on their temporary lakes, request that it shall not be destroyed.

Numbers of Mallard (*Anas boschas*), Widgeon (*Mareca penelope*), and Teal (*Querquedula crecca*) visited these flooded fields in the evenings, but I did not hear of any Pochard (*Fuligula ferina*) being shot there this winter. Four were killed last year (one in a rat trap) in such good plumage that their owners protested against their being styled 'common.' Skeldrake (*Tadorna tadorna*) were to be seen on several occasions in the Hull game shops. This seems an introduction of the London custom of exhibiting Gulls, Owls, etc., 'just for ornament.'

A flock of Grey Plover (*Squatarola helvetica*) was seen inland at Bilton (four miles from Hull) on 21st December, and a single bird at Aldborough on 8th January.

A pair of Stonechats (*Pratincola rubicola*) took up their abode on the cliff at Aldborough at the end of October, and were still there on 8th January. It occurs occasionally in February, but I have never found it breeding in Holderness.

No Bramblings (*Fringilla montifringilla*) or Snow Buntings (*Plectrophanes nivalis*) were seen at Aldborough in 1900.—T. Petch, Hedon, Hull, 21st February 1901.

NOTES AND NEWS.

The Council of the Geological Society has this year awarded the Wollaston Medal to Dr. Charles Barrois, of Lille, the Murchison Medal to Mr. A. J. Jukes-Browne, and the Bigsby Medal to Mr. G. W. Lamplugh. The first-named is best known in this country by his memoir on the English Chalk, published in 1877; and it is a curious coincidence that the two English geologists selected have also carried out important researches in the Cretaceous strata, especially of Lincolnshire and Yorkshire, as well as in the Glacial geology of those countjes.

BOTANICAL NOTES FROM CUMBERLAND FOR THE YEAR 1900.

WILLIAM HODGSON, A.L.S.,
Workington; Author of 'The Flora of Cumberland.'

In the October issue of 'The Naturalist' for 1899 there appeared some notes of mine in reference to additional county stations for species of not very common occurrence in Cumberland, discovered by Mr. W. Thomson, of Carlisle, and by him specimens were passed on to me at Workington for verification. I have since received, through Mr. Thomson's courtesy, specimens of the following, among other plants of more ordinary occurrence, and I am glad to know that he has so zealously prosecuted his researches on the subject of local botany, principally conducted in his hours of leisure in the immediate neighbourhood of the city. This catalogue includes the following, with the localities where gathered, viz.:—*Ranunculus fluitans, Mimulus luteus,* and *Apium nodiflorum,* river Cairn, near Heads Nook.

On the gravel bed of the river Eden, referred to in his last report (1899), opposite to the village of Grinsdale were *Papaver somniferum, Erysimum orientale, Iberis amara, Asperugo procumbens, Lithospermum arvense, Salvia verbenaca, Stachys annua, Silene dichotoma, Lathyrus aphaca, Œnothera biennis, Lychnis Githago,* and *Gypsophila porrigens.*

At and near Monkhill Lough were *Nasturtium palustre, Callitriche hamulata, Gnaphalium sylvaticum, Erythræa centaurium, Menyanthes trifoliata, Pedicularis palustris, Littorella lacustris,* and *Orchis latifolia.*

At and near King Garth, on the Eden, *Geranium dissectum, Silaus pratensis, Cichorium intybus, Orchis ustulata.*

Near to Thurstonfield Lough, *Apium inundatum, Bidens tripartita, Mentha sativa, Potamogeton heterophyllus, Carex panicea* and *C. rostrata.*

About Kingmoor and Todhills Moss, *Genista anglica, Pyrola minor, Ulex Gallii, Triglochin palustre, Glyceria fluitans,* and *Equisetum limosum.*

Near Stainton Banks, *Prunus domestica* (with very fine fruit, no doubt adventive, though far from any dwelling), *Allium oleraceum, A. vineale,* and *Agropyron caninum.*

Cargo, and towards Rockcliffe, *Origanum vulgare, Calamintha clinopodium, Stellaria nemorum,* and *Carex vulpina.*

1901 March 1.

Naworth and Gilsland, *Rubus saxatilis*, *Saxifraga aizoides*, *Lysimachia nemorum*, *Mentha rotundifolia*, *Neottia nidus-avis*, *Habenaria conopsea*, *H. bifolia*, *Epipactis latifolia*, *Carex echinata*, *Melica uniflora*, *Festuca myurus*, and *Cystopteris fragilis*.

How Mill and Cumwhitton, *Ornithopus perpusillus*, *Sedum telephium*, *Filago germanica*, *F. minima*, *Symphytum officinale*, *Mentha piperita* (river Cairn), *Scleranthus annuus*, *Galeopsis speciosa*, *Lamium maculatum*, and *L. album*.

Lyneside and Kirklinton, *Agrimonia eupatoria*, *Saxifraga granulata*, *Ribes rubrum*, *Linaria cymbalaria*, *Luzula pilosa*, and *L. maxima*.

Edenside, from Carlisle and Botcherby to Armathwaite and Kirkoswald, *Corydalis claviculata* and *Vicia tetrasperma* (Spa Well), *Cardamine amara* and *Ribes nigrum* (Armathwaite), *Vicia angustifolia*, *Polygonum amphibium* (Upperby Brick-ponds), *Conium maculatum*, *Chærophyllum temulentum*, *Æthusa cynapium*, and *Hieracium vulgatum* (Tarraby), *Lamium album*, *Carpinus betulus* and *Populus tremula* (Botcherby), *Campanula latifolia* (Wetheral), *Veronica montana*, *Sherardia arvensis* and *Senecio saracenicus* (Armathwaite).

Burgh-by-Sands, Bowness, and Silloth, *Sonchus arvensis*, *Polygonum amphibium* var. *terrestre*, *Myrica gale*, *Epilobium angustifolium*, *Suæda maritima*, *Cochlearia danica* (Skinburness Marsh), *Apium graveolens* (by river Wampool), *Matricaria chamomilla* var. *discoidea* (Bowness), *Butomus umbellatus* (river Eden), *Potamogeton perfoliatus* (river Petteril), *Carex hirta* (Durdar), *Euphorbia portlandica*, *Scirpus rufus* (Sellafield), *Draba muralis* (Nurseries, Carlisle).

Mr. Thomson's most remarkable find of the closing century may be reckoned that of an alien species, *Anchusa ochroleuca*, the identification of which, after sorely puzzling local collectors, was settled by Mr. S. T. Dunn, of Kew Gardens, not many weeks ago.

WORKINGTON, *21st December 1900.*

I will supplement the above lists (Mr. Thomson's gatherings) by a few additional finds by myself and co-workers, premising that my own private explorations have been greatly circumscribed, partly owing to unsettled health and partly to the infirmities naturally resulting from increasing age. I did, however, manage to pay my annual visit to Silloth and Skinburness on the Solway. Among the refuse of Messrs. Carr & Co.'s

extensive steam corn mills the following species were noted. Conspicuously abundant were examples of an alien species, *Ambrosia trifida,* not previously seen there before 1899. A workman told us that the seeds winnowed from grain imported mostly from California were thrown upon the bank close to the mill, as food for the small birds during winter. Three other species belonging to the same order have been remarked in years preceding the present, viz.:—*Ambrosia maritima, Amaranthus alba,* and *A. retroflexus.* On the same bank was abundance of *Camelina sativa,* while in smaller quantity grew *Medicago sativa, Potentilla recta,* and some others. Passing along to the end of the mill premises, we found a heap of decaying straw and other material, on which we saw in plenty examples of *Vicia lutea* (Rough-podded Vetch), *Delphinium Ajacis, Alyssum calycinum, Lepidium campestre, Lactuca Scariola, Silybum Marianum*— the finest I ever saw — *Scandix Pecten-Veneris, Cnicus arvensis* var. *setosus* (differing in outline somewhat from the specimens noted at the Derwent Tin Plate Works at Workington), *Asperula arvensis, Raphanus maritimus* (seedling plants), and medicks of several species, also vetchlings. Nearer the sea, and at the opposite side of the dock basin, *Nasturtium terrestre* and *Neslia paniculata,* the last a remarkably fine specimen.

Passing along shore northwards to Skinburness, we found in an inclosure used for the purpose of a market garden several species, native as well as foreign, which avowedly derived their introduction from material brought from the Silloth mill-yards for manurial purposes. The species included, among others, the following, viz.:—*Trifolium fragiferum, T. striatum, Lactuca scariola, Galium tricorne, Herniaria hirsuta,* and a singular looking medic, which, when stretched at length, was found to support a number of large and curious looking seed vessels, resembling nothing so much as the shells of the *Helix nemoralis* (Banded Snail). This has since been identified as *Medicago scutellata,* and, on the authority of Anne Pratt, is said to be a native of Corsica, Sardinia, and other Mediterranean islands; also *Trifolium filiforme,* a plant which I had never before gathered, and more examples of *Amaranthus alba.* Outside and beyond the inclosures, near the beach, were growing *Rosa canina* var. *Reuteri, Rubus rhamnifolius,* and rooting deeply among the drifted sand were Sea Holly and *Triticum* var. *littorale.* This completed our gathering on a most lovely summer day. *31st December 1900.*

1901 March 1.

NOTES on FLOWERING PLANTS.

***Cotyledon umbilicus* in Furness.**—I discovered this plant at Newbarns, Barrow-in-Furness, in 1871, and while recently at Colton, in the Furness Fells, I found it growing on the rocks near the old mill. Many of the peltate leaves were of large size (2 and 2⅜ inches in diameter). One specimen measured 2⅔ inches in diameter, and the depression in the centre was three-quarters of an inch.—HARPER GAYTHORPE, Claverton, Prospect Road, Barrow-in-Furness, 8th December 1900.

Fig Tree Bearing in the Open.—In the garden at the Warp Farm, Bottesford Moors, N.W. Lincolnshire, stands a Fig tree (*Ficus carica*). This tree was planted by my grandfather about 1820. Several times during my life it has produced fruit that came to full maturity. My first record is 1868, the next 1887, then in the years 1892, 1893, 1897, 1898, 1899. The fruit each time came to full perfection and was of beautiful flavour. The tree is sheltered by a wall and a chimney, but for the last five and twenty years no fire has been lighted in the grate with which the flue is connected. —MAX PEACOCK, The Manor, Bottesford, Lincolnshire, 7th July 1900.

Mistletoe at Sheffield of Eld.—On the strength of an holograph memorandum by Dr. Leonard Plukenet, in the British Museum copy of Ray's 'Catalogus Plantarum Angliæ' (1st ed. 1670), of which I have recently found (or re-found, perhaps) a transcription in one of certain MSS. notebooks of the Rev. W. W. Newbould's in my possession; it is well worth outpoint that 230 years ago *Viscum album* grew 'Sheffieldiam adeat,' that is nigh to or approaching the city of cutlery. It is also another stone added to the cairn of a conclusion; evidence pointing how completely the florulas of districts can alter in course of time; of how possible, nay certain, it is that the woodland of Wentworth or Beausheaf was once rich in such arborescence as Mistletoe and Wild Service-tree, and on the Rivelin moorways such herborescence as *Salix herbacea* or *Hypericum medium*; now alike, all things of the Past, their places filled by other plants and other peripatetics to observe them, who seeing only with their own eyes are hard of belief.—F. ARNOLD LEES, Leeds, 16th January 1901.

Autumn in Lakeland (1900).—It was difficult to resist becoming enthusiastic over the autumnal pageantry as displayed by the Lakeland trees this year. I do not remember to have ever seen a parallel to it. It seemed to me that, given the conditions, the effect was as brilliant as it could well possibly be, at least in some particular instances. For example, there was a middle-aged Rowan tree (*Pyrus aucuparia*) growing on the extreme edge of a bank overhanging Deepdale Beck. A few of its leaves were on 21st October of a slightly brownish-yellow tint, but all the rest were of a deep, almost pure, crimson. I have never seen a finer autumnal display by any Rosacean. On the other hand, the leaves of the Wild Cherry (*Prunus avium*), which, in most autumns, exhibit a tolerably fair livery, were this year decidedly browner than usual, so far at least as I had opportunities for the observance of them. There were two other features, however, which were eminently noteworthy. First, I noticed some few leaves of the Alder (*Alnus glutinosa*), which were glossed over, as it were, with a faint purplish red of the same shade as their petioles exhibit towards the close of the season. Secondly, and even more remarkable, I observed an occasional Hazel (*Corylus avellana*) leaf which had evidently put forth strenuous efforts (to speak metaphorically) that they might show off something fine; they were tinted of a red, only slightly brownish, which was about as bright a decoration as their chromogen could possibly allow. The brilliancy of the yellows was about equal to the ordinary occasion in the case of the Wych Elm (*Ulmus montana*), but certain specimens of the Common Elm (*Ulmus campestris*) hung out a golden drapery surpassingly dazzling. One or two Spanish Chestnuts (*Castanea vulgaris*) were festooned with such an intermingling of gold, brown, and green, as, I should think, is rarely witnessed in these dales.—P. Q. KEEGAN, Patterdale, Westmorland, 12th November 1900.

YORKSHIRE LEPIDOPTERA IN 1900.

WILLIAM HEWETT,

Hon. Sec. Entomological Section of the Yorkshire Naturalists' Union.

In presenting my report on the more uncommon species of Macro-Lepidoptera which have been obtained in Yorkshire during 1900, I wish to make special reference to the fact that I have written to 59 entomologists for notes of species obtained, and that of these 52 have replied, although 17 have not sent lists owing to their having nothing of interest to communicate, whilst 7, I regret to say, have not taken the trouble to reply.

The list comprises 221 species, made up as follows:—Diurni, 18; Nocturni, 22; Drepanulidæ, 2; Pseudo-Bombyces, 7; Geometræ, 84; and Noctuæ, 88.

Of the Diurni, the most interesting, either on account of unusual abundance or rarity, are *Colias edusa* and its var. *helice*, *C. hyale*, *Vanessa atalanta*, *Thecla w-album*, and *Syrichthus alveolus*; of the Nocturni, *Acherontia atropos*, *Sphinx ligustri*, the specimen of *Arctia lubricipeda* var. *radiata* from Withernsea, and *Liparis salicis*; of the Geometræ, *Hemithea thymiaria* and *Cidaria dotata*, and the almost total absence of any dark varieties of *Abraxas ulmata* from Sledmere, where, in 1897, 1898, and 1899, they were so common; and amongst the Noctuæ *Cymatophora ridens*, *C. fluctuosa*, *Acronycta alni*, *Mamestra abjecta*, *Xanthia aurago*, the three specimens of the var. *unicolor* of *Cirrhœdia xerampelina* occurring out of 150 specimens bred by Mr. Porter, of Hull, whereas Mr. Sumner, of Everingham, did not get one example of this variety from some four hundred specimens obtained at Everingham in 1897, *Euperia fulvago*, *Hecatera serena*, *Stilbia anomala* (which in one Yorkshire locality, not to be mentioned here, now occurs in some numbers).

Messrs. Boult and Porter, of Hull; Ash, of Skipwith; Booth and Beanland, of Saltaire, report the 'season a bad one, sugar of little use, and many usually common insects scarce'; still, viewing it from the standpoint of the information which I have been enabled to collect from the 42 lists received, it appears to have been a better season than have many of the preceding ones.

Sugar has again failed to attract moths in anything like the numbers that older entomologists remember, and we now sigh in vain for the sugaring nights of long ago, when the very abundance, rather than rarity, made the task of selecting the

aristocrats from the vulgar mob a by no means easy task, and the ubiquitous *Agrotis exclamationis*, *Xylophasia polyodon*, *Triphæna pronuba*, *Noctua xanthographa*, *Cosmia trapezina*, and other very common fry were uninvited, troublesome, and unwelcome visitors to our sweets, while now, even they refuse to be attracted by the alluring bait.

The *Sallows* were not generally productive, and many of the usual attendants were conspicuous by their absence or rarity.

I regret to note that our friend Mr. J. Sumner, to whom we were so much indebted for material used in the compilation of the 1807 list, has since left Yorkshire, and in the present list only occurs as sponsor for the var. *olivacea* of *Polia chi*.

Light Traps do not seem to have been resorted to by the three entomologists possessing them, or, if so, with very bad results, as I have no records of captures; let us hope for better things in 1901 and future years of the new century, as light, in my opinion, is the means by which additions to our county list will be made.

In addition to the 12 questions on which I solicited information in my 1807 list, pp. 160, 161, and 162, I would add another, viz., dates of hibernation, where possible, of either larvæ or imagos of those species which live through the winter and place of hibernation, and, with reference to the larvæ, the age at which they hibernate, whether *in*, *on*, or *away from* the food-plant.

On behalf of the Evolution Committee of the Royal Society, I venture to make a special appeal to all Yorkshire entomologists for information respecting the progressive melanism of any species of moths, but more particularly of the following: *Acidalia aversata*, *Amphidasys betularia*, *Boarmia repandata*, *Camptogramma bilineata*, *Gnophos obscurata*, *Hemerophila abruptaria*, *Hybernia progemmaria*, *Phigalia pilosaria*, *Acronycta psi*, *Agrotis cortica*, *Aplecta nebulosa*, *Polia chi*, *Venusia cambrica*, and *Xylophasia polyodon*. The information required is as follows:

Genus and Species.

1. Which forms of the above species are now found in the district?
2. Which is considered the prevailing form? In about what proportions are the different forms now found?
3. At what date do you believe the melanic forms began to appear in the district?
4. When melanism first appeared in the district:
   (*a*) Were the darkest forms then found?

(*b*) Did distinctly melanic forms suddenly appear and light forms become gradually scarcer?

Or, (*c*) Did the specimens of the district become, as a whole, gradually darker year by year?

5. If the light forms have quite disappeared from the district, can you state at about what date they were last seen in it?

6. What are the conditions of the district as regards prevalence of smoke? Did changes in this respect take place at the time when melanism first appeared?

1A. In describing refer when possible to published figures in illustration of your description, and say how your specimens compare with these figures.

2A. Give actual numbers when possible, otherwise say whether 'abundant,' 'fairly common,' 'scarce,' 'very scarce,' or 'absent.'

3A. If generally distributed in the district, it will be sufficient to say so.

4A. Whether at light, at sugar, bred from eggs, larvæ, or dug pupæ, resting on tree-trunks, stones, or otherwise.

This information may be sent either to Mr. W. Bateson, F.R.S., Merton House, Grantchester, Cambridge, direct, or to Mr. W. Denison Roebuck, F.L.S., for publication in 'The Naturalist.'

In concluding these preliminary remarks, and in presenting my readers with the report for 1900, I have great pleasure in acknowledging the ready help I have received from so many entomologists, both in supplying me with lists of their captures, and in so willingly replying to all my inquiries respecting these. As they can imagine, the task has *not* been a light one, but it has to the author truly been a labour of love, and a very real pleasure to help, in however infinitesimal a manner, to throw a little more light on the distribution and natural history of some of the species which inhabit the grand county with which he and they are associated. What we especially require are *facts*, an abundance of *facts*, and I would earnestly impress upon all readers the necessity of keeping a diary of their more important captures, with any interesting particulars relating thereto, so that they may be available either for future years' reports of this kind, or for a new edition of Mr. G. T. Porritt's list of Yorkshire Lepidoptera, a work which, in the writer's opinion, should be in the hands of all Yorkshire entomologists, as also should a copy of this report and those of 1891 and 1897.

1901 March 1.

DIURNI.

Gonepteryx rhamni. Sheffield (Cockayne).

Colias edusa. Two ♂s at Skipwith, an addition to local list (C. D. Ash). Pocklington (Leadman). Ripon (Watts). Two ♂s near Easingwold, 6th September (S. Walker). Clifton, York, two ♂s and one ♀ (J. Hawkins). Rotherham (J. Bloor). One specimen in lane near Wadworth Wood (C. E. Young). Shipley Glen, near Bradford (F. Booth and J. Beanland). More plentiful in the Hull neighbourhood than since 1887; one collector took over fifty specimens in one day near Beverley, and some three dozen were seen in a clover field on the Humber bank by another, also odd specimens in the town (J. Boult, Hull). A specimen captured on 16th August near Guisborough, by the Rev. C. M. Withington, of Great Ayton. One seen in Grange Road, Middlesbrough, on 10th September, by Mr. C. Milburn; another seen in a clover field near Middlesbrough, on 12th September, by Mr. Elgee. Sixteen specimens obtained on the Newbald Road, Beverley (J. R. Lowther). Several specimens, one on the South Cliff, Scarborough, on 25th September, by W. Gyngell (T. W. Lownsborough).

Var. ***helice.*** One on the Yorkshire coast (Stevens).

Colias hyale. Bridlington, 25th August (H. H. Corbett). Ripon (Fawcett). Beverley (J. R. Lowther). Seen at Redcar, Middlesbrough, and Newton-under-Roseberry, 13th September (W. Sachse). One taken by a friend on a privet hedge at 8.45 a.m. near Hull (C. Couldwell).

Argynnis paphia. Helmsley (Arthur Angel).

Argynnis aglaia. Fairly common at Helmsley (Arthur Angel).

Argynnis euphrosyne. Fairly common at Kirbymoorside (Arthur Angel).

Argynnis selene. Castle Howard (J. Hawkins). Sandburn Common, York (W. Hewett and S. Walker). Ingleby Greenhow (F. Elgee).

Vanessa io. Wadworth (C. E. Young). Elland and Luddendenfoot (J. Halliday). Several imagines at Beverley (J. R. Lowther). Barnsley, 26th August; also at Worsborough (A. Whittaker). One specimen only noted at Ayton (W. C. Hey).

Vanessa atalanta. Has occurred in great numbers all over the county, and was undoubtedly the butterfly of the season.

Vanessa cardui. Both in the imago and larval state by J. E. Crowther, of Elland. Pocklington (Leadman). Ilkley (J. Wigin). Abundant at Wilsden (E. P. P. Butterfield). Abundant at Beverley (J. R. Lowther). Fairly common at Barnsley (A. Whittaker).

Erebia medea. Common at Grassington, its only Yorkshire locality; there, according to Mr. F. Booth, it is very local, and occurs in different portions of the wood in different years (F. Booth, H. Phillipson, and H. Mousley).

Satyrus semele. Very common near Kirbymoorside (Arthur Angel).

Chortobius davus. Several obtained on Thorne Moor by J. Porter and J. Boult, of Hull.

Thecla w-album. Larvæ abundant at its Yorkshire headquarters, Edlington and Wadworth Woods.

Lycæna agestis. Sledmere (W. Hewett).

Lycæna argiolus. Common at its principal Yorkshire habitat near Rotherham.

Syrichthus alveolus. Kirbymoorside (Arthur Angel).

Thanaos tages. Twelve specimens taken on 4th June on the railway embankment near Cherry Burton (J. R. Lowther). Hylton, 10th June (W. Sachse).

NOCTURNI.

Acherontia atropos. See 'Yorkshire Post.' Hovingham Hall, August (Worsley). Boston Spa, 19th August (Prince). Two larvæ, Ripon (Smith). Fifteen larvæ at Beverley (Boyes). Keighley, 30th August (Longton). An imago, 30th August, Horsforth. Larvæ, Netherton (White). One imago at the electric light, St. Sampson's Square, York, 22nd October (J. Hawkins). One larva at Beningbrough (W. Hewett). Larvæ at Goole (W. Roper). Bridlington (Hobson). Normanton (Townsend). Skipwith (C. D. Ash). One larva at Haxby (Thurgood). Several larvæ at Pocklington. Plentiful all over the Hull district; Mr. Chapman had eleven dozen larvæ sent from Kilnsea (J. Boult). Three larvæ at Stanley, near Wakefield (W. G. Charles). One larva at Newton-on-Ouse, near York (J. Hawkins). Pickering, two larvæ (Metcalf). From August to October larvæ were frequently brought to me by 'potato pickers'; through forcing I have bred several imagines from these; Doncaster (H. H. Corbett). Some 50 larvæ and pupæ obtained at Beverley, four of which I secured

myself, and the records of emergences in the perfect state are more numerous than usual (J. R. Lowther). Two larvæ, 21st September, at Kildale, and pupa, 3rd November. Redcar (W. Sachse). Larva at Withernsea (C. Couldwell). One caught at Worsborough Bridge, 18th June, flew in at open bedroom window at night (A. Whittaker). More plentiful than usual; one moth taken at Scarborough, 4th August, also larvæ at Sherburn, 24th August; at Brompton, 3rd September; and at Ayton, 5th September (T. W. Lownsborough). One perfect insect in the spring, three caterpillars in August, one chrysalis in September, all close to Ayton (W. C. Hey). Four larvæ at Whitby (E. Halliday). Several at Seaton Ross (Blackburn).

Sphinx ligustri. Larva, 29th September, at Ingleby Greenhow, found feeding on privet (F. Elgee). Mr. Elgee also records rearing a specimen from a pupa, June 1899, given to him by a friend at Northallerton, who took three larvæ in 1899.

Chærocampa porcellus. Scarce at Skipwith (C. D. Ash). One specimen at Fulford, near York (W. Hewett). At Hullbank, by daughter of Colonel Haworth-Booth (J. Boult).

Macroglossa stellatarum. Common, but not so numerous or widely distributed as last year. Scarborough, York, Flamborough, Bempton, Speeton, Bridlington (W. Hewett). Beverley (W. Johnson). Even more plentiful in my garden than last year, Crosland Hall, near Huddersfield (G. T. Porritt). I saw five or six early in the season, but have not heard of any larvæ or moths having been seen since, Hull (J. Boult). Several at Pocklington (Leadman). Scarce at Stanley (W. G. Charles). One seen at Sheffield (Cockayne). Common this year, Barnsley (A. Whittaker). Often in the garden, West Ayton (W. C. Hey).

Sesia culiciformis. Strensall Common, two specimens (S. Walker).

Sesia bembeciformis. Several taken on Hob Moor, York (J. Hawkins). Hull (C. Couldwell).

Procris statices. Strensall Common (Arthur Angel and J. Hawkins).

Procris geryon. Hart, 14th July (W. Sachse).

Zygæna loniceræ. In great abundance on Sandburn Common, York, and several nice varieties bred: one var. *semilutescens,* and three having all five spots joined in one broad

band, several having second, third, and fourth spots joined (W. Hewett).

Nudaria senex. Askham Bogs, 14th July (W. Hewett).

Nudaria mundana. Larvæ in the utmost profusion; every stone I lifted had on it from one to six or more, Keighley (A. Broadley).

Lithosia mesomella. Common at Sandburn Common (W. Hewett).

Euthemonia russula. Strensall Common (J. Hawkins).

Arctia mendica. Askham Bog (W. Hewett and W. Tunstall).

Arctia lubricipeda. A beautiful example of the var. *radiata*, a female, obtained at rest on a wall of some farm buildings near the sea-wall at Withernsea by J. Boult, who also secured at the same time and place a female variety resembling var. *eboraci*.

Liparis salicis. Several specimens bred from larvæ obtained on poplar at Beverley (W. Johnson). One larva taken off poplar at Worsborough, 8th August (A. Whittaker).

Orgyia antiqua. Larvæ swarmed at Rotherham (C. Young).

Demas coryli. Larvæ at Grassington (F. Booth and J. Beanland).

Trichiura cratægi. Larva obtained at Melbourne (W. Hewett). Larva at Sandburn (R. Dutton and S. Walker).

Pœcilocampa populi. Bred from cocoon found at Kilton Woods, 15th November (W. Sachse). Fairly plentiful at Keighley (A. Broadley). Larvæ, Sledmere (S. Walker).

Eriogaster lanestris. Larvæ very common in many parts of Yorkshire; Melbourne, Wheldrake, Huntington, Sandburn, Strensall, etc. (W. Hewett).

Odonestis potatoria. From a large number of larvæ of this species obtained in the East Riding I bred some beautiful dark females, several of which resembled very closely the male in colouration; I also bred numerous intermediate varieties, and my experience with this species goes to prove that the females are much more variable than the males.

DREPANULIDÆ.

Platypteryx lacertula. Grassington (F. Booth and J. Beanland).

Platypteryx falcula. Methley (J. Wigin). Sandburn (W. Hewett). Medge Hall, 27th September (R. T. Cassal). Beaten from birch trees in plenty at New Park Spring Wood, 16th and 30th June, etc. (A. Whittaker).

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PSEUDO-BOMBYCES.

Dicranura furcula. Five imagines taken between the 16th and 26th June, all at rest on the trunks of willow trees, Beverley (J. R. Lowther). Larva at Ryehill (C. Couldwell).

Dicranura bifida. Dinsdale (W. Sachse). Five larvæ by J. Boult and M. Waller on *Populus nigra* at Scarborough, 6th August.

Petasia cassinea. One male obtained at the electric lamp near the Police Station, York, October (W. Hewett). Larvæ at Keighley (A. Broadley). Larvæ at Sledmere (S. Walker).

Ptilodontis palpina. Larva at Keighley, 1st September (W. Sachse). One specimen captured at Beverley (W. Johnson).

Notodonta dictæa. Larvæ noted, Worsborough Bridge, 4th August (A. Whittaker). Larvæ at Wadworth (L. S. Brady). Askham Bogs (J. Hawkins). Larvæ fairly common at Methley (J. Wigin). Larvæ at Wheatley and Wadworth Woods on *Populus tremula* and *P. nigra* (H. H. Corbett).

Notodonta dictæoides. Skelmanthorpe (B. Morley). Several bred 2nd, 17th, and 19th July from eggs at Ingleby-Greenhow (F. Elgee). Imago and larvæ near Sheffield (Cockayne). Larvæ at Wheatley and Wadworth Woods, on birch (H. H. Corbett).

Notodonta ziczac. Larvæ on poplar at Darlington (W. Sachse). Sheffield (Cockayne). Larvæ on *Populus nigra* and *P. tremula* at Wheatley and Wadworth Woods (H. H. Corbett).

GEOMETRÆ.

Epione vespertaria. Common in both the larval and imago state in its well-known locality near York.

Epione apiciaria. Both larvæ and imagines at Methley (J. Wigin). Saltaire (F. Booth and J. Beanland). Keighley (A. Broadley).

Epione advenaria. Wadworth (L. S. Brady and W. Brooks). Edlington (W. Brooks, B. Morley, and A. Whittaker).

Venilia maculata. Great Ayton, 4th June (W. Sachse). Grassington, common in June (G. T. Porritt).

Ellopia fasciaria. Eston, 28th July (W. Sachse).

Eurymene dolobraria. Beverley (W. Johnson).

Pericallia syringaria. A specimen netted in Burton Bushes, Beverley (J. R. Lowther).

Ennomos alniaria Haw. = ***tiliaria*** Hübn. One ♂, at light, Skeldergate Bridge, York (W. Hewett). Keighley (F. Booth and J. Beanland). Beverley (J. R. Lowther). Darlington, 11th September (W. Sachse). One specimen at Hull. Keighley (W. Feather). Barnsley (A. Whittaker).

Ennomos fuscantaria. Saltaire (J. Beanland).

Ennomos erosaria. One larva at Wadworth (L. S. Brady).

Ennomos angularia. One specimen seen in the Hospital, Rotherham (J. Hague). Two specimens at Beverley (J. R. Lowther).

Phigalia pilosaria. Very scarce in the Bradford neighbourhood owing to the increased number of houses and consequent constant thinning of the woods; the Bradford district is under a cloud of smoke day and night (F. Booth and J. Beanland). Mr. Booth suggests that the ordinary forms of species which have become melanic of late years are now much less common at Bradford, and instances such species as *Hibernia progemmaria, H. leucophearia, Boarmia repandata,* and *Phigalia*, and says of these four species that a light or typical form is now rarely seen.

Nyssia hispidaria. Three imagos at Stanley (W. G. Charles).

Amphidasis prodromaria. Sheffield (Cockayne). One larva taken at Raincliffe by Mr. Head, of Scarborough.

Amphidasis betularia var. ***doubledayaria.*** Mostly black forms at Methley (J. Wigin). Imagines at Sheffield (Cockayne). York (J. Hawkins). The variety is now commoner than the type in this district. Halifax (E. Halliday). Only this form at Saltaire (F. Booth and J. Beanland). Hull (C. Couldwell). Commoner than the type at Barnsley (A. Whittaker).

Hemerophila abruptaria. Two specimens, 6th June, at Burton Bushes, near Beverley (J. R. Lowther).

Cleora lichenaria. Taken on the wing by the wood side, Castle Howard (J. Hawkins).

Boarmia repandata. Bred some very dark forms, but not black, at Sheffield (L. S. Brady). Dark forms at Saltaire (F. Booth and J. Beanland).

Tephrosia biundularia. One or two pretty pale yellow specimens, numerous grey forms at Wadworth (L. S. Brady)

Skelmanthorpe (B. Morley). Strensall (J. Hawkins and W. Hewett), Kilton Woods, 2nd June (W. Sachse). Great Ayton, 5th June (W. Sachse). Elargill Wood, Ilkley, in April and again in July (T. Fieldhouse).

Tephrosia biundularia var. ***delamerensis.*** Wadworth (L. S. Brady). Strensall (W. Hewett and J. Hawkins). Dinsdale, 19th May (W. Sachse). Bishop's Wood, Selby, 29th May (S. Walker).

Tephrosia punctulata. A few at Strensall (W. Hewett). Elargill Wood, Ilkley, in June (T. Fieldhouse).

Geometra papilionaria. Common at Sandburn Common (W. Hewett). Edlington Wood (J. Wigin).

Hemithea thymiaria. Keighley (A. Broadley). Kildwick, near Keighley (T. Feather).

Ephyra punctaria. In abundance at New Park Spring Wood on 16th and 30th June, etc. (A. Whittaker).

Ephyra trilinearia. Sledmere (W. Hewett).

Ephyra pendularia. Sandburn Common (W. Hewett and S. Walker).

Asthena luteata. Edlington (B. Morley). Kilton Woods, 23rd June (W. Sachse).

Asthena candidata. Edlington (L. S. Brady). Kilton Woods, 23rd June (W. Sachse). Grassington (G. T. Porritt).

Asthena sylvata. Edlington (B. Morley and L. S. Brady).

Asthena blomeraria. Not common, Sledmere (W. Hewett). Kilton Woods, near Middlesbrough, 23rd and 30th June (W. Sachse and F. Elgee).

Eupisteria heparata. Wadworth (L. S. Brady). Adel (J. Wigin).

Venusia cambrica. Halifax (E. Halliday). Grassington (F. Booth and J. Beanland). Glaisdale, 7th July (W. Sachse). Keighley (A. Broadley).

Acidalia bisetata. Skipwith, at light; an addition to local list (C. D. Ash).

Acidalia scutulata. Methley (J. Wigin). Fairly plentiful by Worsborough Reservoir (A. Whittaker).

Acidalia incanaria. Methley (J. Wigin). York (W. Hewett).

Acidalia fumata. Common near the border of Derbyshire, but in Yorkshire (L. S. Brady). Ilkley (J. Wigin). Honley Wood, Huddersfield (G. T. Porritt). Kilton Woods, 23rd June (W. Sachse).

Acidalia inornata. In great abundance at Huddersfield, where a hundred specimens a night could have been taken in one wood (G. T. Porritt). Common, Sandburn Common (S. Walker and C. D. Ash).

Timandra amataria. One specimen at light, 14th September, Beverley (J. R. Lowther).

Macaria liturata. Eston, 28th July (W. Sachse). Huddersfield (G. T. Porritt).

Strenia clathrata. Flamborough (Russell).

Numeria pulveraria. Edlington (B. Morley). Grassington (F. Booth and J. Beanland).

Scodiona belgiaria. Adel (J. Wigin). Fairly common in Strines Wood, Sheffield (Cockayne).

Aspilates strigillaria. Strensall (W. Hewett).

Abraxas ulmata. Only one lead-coloured form taken this season, and this was secured by R. Dutton, 30th June. Striking varieties of this species were this year decidedly scarce, and the type was by no means so common as usual. Swarmed at Edlington Wood (B. Morley).

Ligdia adustata. Edlington (B. Morley and L. S. Brady).

Hibernia leucophearia var. ***marmorinaria.*** Not common, Barnsley (A. Whittaker).

Hibernia progemmaria var. ***fuscata.*** In the vicinity of Mapplewell, near Barnsley, five or six specimens of var. *fuscata* will be taken to one of the lighter form (A. Whittaker).

Oporabia filigrammaria. Halifax (E. Halliday). Sheffield (Cockayne).

Larentia multistrigaria. Melanic forms were taken at Huddersfield by Mr. W. Tunstall.

Larentia cæsiata. Ilkley (J. Wigin). Halifax (E. Halliday). Sheffield (Cockayne). Netherwood, Ilkley, June (T. Fieldhouse).

Larentia salicata. Netherwood, Ilkley, June (T. Fieldhouse).

Emmelesia affinitata. Saltaire (F. Booth and J. Beanland). Kilton Woods, 23rd June (W. Sachse). Edlington Wood, (A. Whittaker).

VAR. ***turbaria.*** Kilton Woods, 23rd June (W. Sachse).

Emmelesia alchemillata. Grassington, in June, common (G. T. Porritt).

Eupithecia venosata. Halifax (E. Halliday). Methley (J. Wigin). Barnsley (A. Whittaker).

Eupithecia subfulvata. Sheffield (Cockayne).

Eupithecia trisignaria. Larvæ, 27th September, Medge Hall (R. T. Cassal).

Eupithecia lariciata. Common, fir plantation, New Park Spring Wood, Barnsley (A. Whittaker).

Eupithecia albipunctata. Larvæ, 27th September, Medge Hall (R. T. Cassal).

Eupithecia fraxinata. Larvæ common on young ash trees near Leyburn, 4th August (G. T. Porritt).

Eupithecia indigata. Skipwith (C. D. Ash).

Eupithecia minutata. Larvæ, 27th September, Medge Hall (R. T. Cassal).

Eupithecia assimilata. Sheffield (Cockayne). Rotherham (C. Young).

Eupithecia rectangulata. Methley (J. Wigin).

Collix sparsata. Askham Bogs (W. Hewett).

Lobophora lobulata. Strensall (W. Hewett).

Hypsipetes impluviata. Adel (J. Wigin).

Melanthia rubiginata. Adel (J. Wigin). York, common but very local (W. Hewett). Hull (J. Porter). Common at Rockley, near Barnsley (A. Whittaker).

Melanthia albicillata. Edlington Woods (W. Brooks). Grassington (F. Booth and J. Beanland). Sheffield (Cockayne). Sledmere (W. Hewett). Kilton Woods, 23rd June (W. Sachse). Keighley (A. Broadley). One specimen, Crockey Hill, near York, 15th June (W. Hewett). This species is very rare in the York neighbourhood.

Melanippe hastata. Common near the border of Derbyshire, but in Yorkshire (L. S. Brady). Swarmed at Wadworth and Edlington Woods (J. Bloor and others). New Park Spring Wood, Barnsley (A. Whittaker).

Melanippe tristata. Ilkley (J. Wigin). Sheffield (Cockayne). Common at Edlington and Wadworth (L. S. Brady). Abundant at Silkstone Fall Wood, Wharncliffe Chase (A. Whittaker).

Melanippe galiata. Sheffield (Cockayne). Huddersfield (G. T. Porritt).

Coremia propugnata. Ilkley (J. Wigin). Kilton Woods, 23rd June (W. Sachse). Netherwood, Ilkley, June (T. Fieldhouse).

Phibalapteryx lignata. Scarce, Askham Bogs (W. Hewett).

Scotosia dubitata. Methley (J. Wigin). Sheffield (Cockayne).

Scotosia vetulata. Larvæ very common at the Askham Bog Excursion, Whit Monday, 4th June, taken by S. Walker, J. Hawkins, J. Boult, J. Porter, B. Morley, T. A. Lofthouse, and W. Tunstall.

Scotosia rhamnata. Skipwith, taken at dusk in garden; an addition to local list (C. D. Ash). Askham Bogs (W. Hewett).

Scotosia undulata. One specimen taken on Sandburn Common, July (W. Hewett).

Cidaria suffumata var. ***piceata.*** Common at Wadworth; also two beautiful examples of the variety *porrittii* (L. S. Brady). Great Ayton, 6th June (W. Sachse).

Cidaria silaceata. Skelmanthorpe (B. Morley). Sledmere (W. Hewett). Grassington (F. Booth and J. Beanland). Wadworth (L. S. Brady). Kilton Woods, 30th June (W. Sachse). Glaisdale, 7th July (W. Sachse).

Cidaria prunata. Saltaire (F. Booth and J. Beanland).

Cidaria dotata. Saltaire (F. Booth and J. Beanland). Eston, 28th July (W. Sachse). Netherwood, Ilkley, July (T. Fieldhouse).

Pelurga comitata. Methley (J. Wigin). Keighley (F. Booth and J. Beanland). Fairly common at Barnsley (A. Whittaker).

Anaitis plagiata. Edlington (B. Morley). Sheffield (Cockayne). Grassington (F. Booth and J. Beanland). Taken sparingly at Rockley, near Barnsley (A. Whittaker).

Chesias spartiata. Numerous amongst broom near Middlesbrough, 12th Oct. (F. Elgee).

Tanagra chærophyllata. Skelmanthorpe; a specimen on 7th July with the right hind-wing a pale grey, and another with the margins of both hind wings light-coloured, shading away to black at the base of the wings (B. Morley).

NOCTUÆ.

Thyatira derasa. Kilton Woods, sugar, 1st July (W. Sachse).

Cymatophora ridens. Five specimens taken at Raincliff, Scarborough, in July, by A. Head; was first taken in the district in 1898, when one moth was obtained, and one larva in 1899, Scarborough (T. W. Lownsborough).

Cymatophora duplaris. Grassington (F. Booth and J. Beanland).

Cymatophora fluctuosa. One specimen, 16th June, New Park Spring Wood (A. Whittaker).

Acronycta leporina var. ***bradyporina.*** Larvæ at Wadworth (L. S. Brady and C. Young). Two full-fed larvæ, Methley (J. Wigin). Two moths and several larvæ, Worsborough Bridge (A. Whittaker).

Acronycta megacephala. Methley (J. Wigin). Larvæ, Wadworth (L. S. Brady).

Acronycta alni. One specimen emerged 24th May from a larva found at Methley on ash, 10th August 1899 (J. Wigin). Larvæ, Maltby Common (C. Young).

Acronycta ligustri. Larvæ common on young ash trees near Leyburn, 4th August (G. T. Porritt). Grassington (F. Booth and J. Beanland).

Acronycta menyanthidis. Larvæ and cocoons, common, Keighley (A. Broadley). Sheffield (Cockayne). Huddersfield, common (G. T. Porritt). Three, Skipwith (C. D. Ash). One, 4th June, Methley (J. Wigin). Oakworth Moor, Ilkley (T. Fieldhouse). Keighley (F. Booth and J. Beanland).

Acronycta menyanthidis. Common on Penistone Moors (A. Whittaker).

Leucania littoralis. A few at sugar, Spurn (J. Porter).

Leucania pudorina. Askham Bogs, 15th July (W. Hewett).

Nonagria typhæ. Common, Hull (Porter and Russell). Very abundant, Worsborough Reservoir, etc. (A. Whittaker).

Nonagria lutosa. A specimen at the electric light, Police Station, York, October (W. Hewett). Common at Hull (Porter and Russell).

Gortyna flavago. Three specimens, Forge Valley (J. Hawkins). Larvæ common in thistles on Dearne Banks, Ardsley (A. Whittaker).

Xylophasia polyodon var. ***infuscata.*** Two imagines, Methley (J. Wigin). Several at sugar, Hull (J. Boult). Only this form seen in the Bradford neighbourhood (F. Booth and J. Beanland).

Xylophasia hepatica. Methley (J. Wigin).

Xylophasia scolopacina. Occurred in my garden at Crosland Hall, Huddersfield (G. T. Porritt). Not uncommon at Rockley (A. Whittaker).

Neuria saponariæ. Edlington (B. Morley).

Cerigo cytherea. At sugar at Spurn (J. Porter).

Luperina testacea. This usually abundant species, remarkable for being generally common everywhere, has been decidedly scarce at Hull and York.

Mamestra abjecta. Port Clarence, 24th July (W. Sachse). One specimen at sugar, Hull, where it is very scarce (J. Porter). One specimen at Spurn (J. Porter).

Mamestra albicolon. Three or four specimens at sugar, Spurn (J. Porter).

Apamea unanimis. Methley (J. Wigin). Abundant, especially larvæ, hybernating under willow bark, Worsborough Reservoir (A. Whittaker).

Caradrina morpheus. Methley (J. Wigin).

Caradrina alsines. A few at sugar, Hull (J. Porter).

Caradrina blanda. Saltaire (F. Booth and J. Beanland). At sugar, Hull (J. Porter).

Agrotis valligera. At sugar, Spurn (J. Porter).

Agrotis suffusa. Methley (J. Wigin).

Agrotis saucia. Middlesbrough, on 8th October and 1st and 3rd November (F. Elgee and W. Sachse).

Agrotis ripæ. One specimen at sugar, Spurn (J. Porter).

Agrotis nigricans. Methley (J. Wigin).

Agrotis tritici. A melanic specimen bred from a larva collected in the Halifax district, where the species is very rare (E. Halliday). Methley (J. Wigin). At sugar, Spurn (J. Porter).

Agrotis agathina. Larvæ, scarce, Skipwith (C. D. Ash). Larvæ, 26th May, at Ingleby Greenhow (F. Elgee).

Agrotis ravida. Twelve specimens taken at sugar, Hull (J. Boult, Russell, J. Porter, and C. Couldwell). Several specimens at sugar, Spurn (J. Porter).

Agrotis lucernea. Halifax (E. Halliday). Oakworth Moor, Ilkley, July (T. Fieldhouse).

Tryphæna janthina. Methley (J. Wigin). Kilton Woods, 15th September (W. Sachse). Leyburn (G. T. Porritt). Huddersfield, abundant (G. T. Porritt).

Tryphæna fimbria. A few larvæ, Rotherham (J. Bloor and J. Hague). Methley (J. Wigin). One in Ingleby Greenhow Church (F. Elgee). Skelmanthorpe (B. Morley).

Noctua glareosa. Fairly common; a fine red variety taken in a wood at Strines, near Sheffield (L. S. Brady). Near Barnsley (A. Whittaker).

Noctua dahlii. Fairly common near Sheffield (L. S. Brady).

Trachea pimperda. Three at Strensall (W. Hewett).

Tæniocampa leucographa. Common at Bishop's Wood at sallows (W. Hewett, C. D. Ash, R. T. Cassal, J. Waddington, L. S. Brady, and S. Walker).

Tæniocampa opima. Two specimens, Skipwith (C. D. Ash).

Tæniocampa populeti. Scarce at Bishop's Wood (W. Hewett).

Tæniocampa gracilis. As usual scarce, but a beautiful pink-coloured form was taken by S. Walker at Bishop's Wood.

Tæniocampa munda. Scarce at Bishop's Wood (S. Walker and W. Hewett). Strensall (W. Hewett).

Orthosia suspecta. Askham Bog and Sandburn (J. Hawkins). Sheffield (Cockayne).

Orthosia upsilon. Methley (J. Wigin). A few larvæ at Hull (J. Porter). Barnsley (A. Whittaker).

Orthosia lota. Methley (J. Wigin). Bishop's Wood (G. T. Porritt).

Anthocelis pistacina. Methley (J. Wigin).

Cerastis spadicea. At ivy bloom, Hull (J. Porter).

Xanthia citrago. On lime at Ingleby Greenhow, 18th August (W. Sachse).

Xanthia aurago. Skelmanthorpe (B. Morley).

Xanthia gilvago. One specimen at gas-lamp on the New Walk, York (W. Hewett). A few larvæ at Wadworth (L. S. Brady and J. Bloor). One specimen at Scarborough (T. W. Lownsborough).

Cirrhœdia xerampelina. Eight imagos and several larvæ in April, found by searching the ash tree trunks after dark, at Beverley (J. Boult and J. R. Lowther). Scarce at Skipwith (C. D. Ash). Three of the var. *unicolor,* reared from some 160 larvæ at Anlaby (J. Porter).

Tethea subtusa. Sheffield (Cockayne).

Euperia fulvago. Two specimens taken in Deffer Wood, near Huddersfield, by B. Morley, early in September. Larvæ at Wadworth (L. S. Brady). Larvæ in plenty on birch at Wadworth and Edlington (C. Young).

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Mammals of Bottesford Parish.—Max Peacock.

The Pollard Willow, Bottesford.—Max Peacock.

Lincolnshire Naturalists at Scunthorpe.—Henry Preston, F.G.S.

Pairing of Limax maximus (Illustrated).—H. Wallis Kew, F.Z.S.

Changes in the Halifax Flora.—C. E. Moss, B.Sc.

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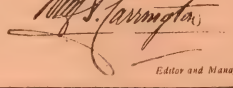

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BOOKS RECEIVED.

Bücher-Verzeichniss von R. Friedländer & Sohn.—No. 436, Ornithologie, received 2nd March 1901. [Publishers.

N. American Fauna, No. 16, 28th October 1899: Results of a Biological Survey of Mount Shasta, California, by C. Hart Merriam. [U.S. Dept. Agric.

Bristol Naturalists' Society.—Exchange List, 6th March 1901. [The Society.

Bristol Nat. Society.—Proceedings, New Series, Vol. 9, Part 2, for 1899. [The Soc.

British Association.—Report of 70th Meeting, at Bradford, Sept. 1900. [Association.

Cardiff Naturalists' Soc.—Report and Trans., Vol. 32, 1899-1900. [The Society.

North Lonsdale Magazine, Vol. 4, No. 4, December 1900. [Mr. S. Lister Petty.

Boston Society of Nat. History.—Proceedings, Vol. 29, No. 9, April 1900. [Soc.

Manchester Geographical Society.—Supplement to Vol. 14, Nos. 9-12, for Oct.-Dec. 1898, published January 1901. [The Society.

Manchester Lit. and Phil. Soc.—Mem. and Proc., Vol. 45, Pt. 1, March 1901. [Soc.

Ornithologisches Jahrbuch.—Jahrg. 12, Heft 1, Jan.-Feb. 1901. [Zu Schmidhoffen.

Manchester Geog. Soc.—Journ., Vol. 16, Nos. 7-9, July-Sept. 1900. [The Society.

Revue Bryologique, 28e Année, 1901, No. 2, 16e Mars. [M. T. Husnot, Cahan.

Le Mois Scientifique, 3e Année, No. 3, Mars 1901. [J. B. Baillière & Fils, Paris.

Museo Nacional de Montevideo.—Anales, tomo 2, fasc. 17, Febrero 1901. [Museo.

Hobbies, Vol. 10, No. 281, 2nd March 1901. [The Publishers.

Past and Present, successor to N.H.J., No. 206, 15th Mar. 1901. [E. I. Gower, Editor.

New Mexico College of Agriculture.—Agricultural Experiment Station, Bulletin No. 31, December 1899: A Study of Soil Moisture, by C. A. Keffer and J. D. Tinsley. [College.

Geological Magazine, N.S., Dec. 4, Vol. 8, No. 440, for Feb. 1901.

Geography: Notes of Manch. Geog. Soc.—No. 54, March 1901. [The Society.

Science Gossip, N.S., Vol. 7, No. 82, for March 1901. [John T. Carrington, Editor.

Psyche: Journ. of Entom., No. 299, for March 1901. [Cambridge Ent. Club, U.S.A.

Knowledge, Vol. 24, No. 185, for March 1901. [H. F. Witherby, Ed., London.

La Feuille des Jeunes Naturalistes, No. 365, 1er Mars 1901. [Mons. Adrien Dollfuss.

The Nautilus, Vol. 14, No. 11, for March 1901. [H. A. Pilsbry, etc., Editors.

Entomologists' Record, Vol. 13, No. 3, 15th March 1901. [J. W. Tutt, Editor.

The Irish Naturalist, Vol. 10, No. 3, for March 1901. [The Editors, Dublin.

The Zoologist, 4th Series, Vol. 5, No. 717, 15th Mar. 1901. [West, Newman & Co., Publ.

Nature Notes, Vol. 12, No. 135, for March 1901. [Selborne Society, London.

Aquila, a Magyar Madártani Központ Folyóirata, Vol. 8, Nos. 1-2, 5th Feb. 1901. [Hung. Nat. Museum

Otto Kleinschmidt.—A Falco hierofalco Alakköre, 4to. reprint, 1901. [Hung. Nat. Mus.

R. Snouckaert v. Schauburg.—Ornithologiai naplöm kivonata 1899 évröl, 4to. reprint, 1901. [Hung. Nat. Mus.

Id.—Ceryle alcyon Európában, 4to reprint, 1901. [Hung. Nat. Mus.

Stefan Chernel v. Chernelháza.—A madarak hasznos és káros voltáról positiv alapon, 4to. reprint. [Hung. Nat. Mus.

Jakab Schenk.—A Madárvonulás Magyarországon az 1899, etc., 4to. reprint, 1901. [Hung. Nat. Mus.

Cosmia affinis. Methley (J. Wigin). Larva at Edlington, 3rd September (B. Morley).

Dianthæcia cucubali. Saltaire (F. Booth and J. Beanland). Keighley (A. Broadley). Fairly plentiful at Barnsley (A. Whittaker).

Hecatera serena. One specimen taken from a wall at Hull (J. Porter). Two at Hull (Russell).

Polia chi var. ***olivacea.*** Sheffield (Cockayne). Six or eight specimens taken at Shibden, near Halifax (J. Sumner).

Dasypolia templi. Halifax, 17th October (E. Halliday). Four at gas-lamps, 30th October, at Skelmanthorpe (B. Morley). At lamps, Bradford, October (T. Fieldhouse).

Epunda lutulenta. A dozen at sugar, in own garden, at Middlesbrough (T. A. Lofthouse). Also recorded by Messrs. W. Sachse and F. Elgee.

Epunda viminalis. Larvæ on sallow, 4th June, Great Ayton (W. Sachse). Bishop's Wood, fairly common (G. T. Porritt).

Aplecta herbida. Kilton Woods, 15th July (W. Sachse).

Aplecta occulta. Two specimens at sugar in own garden at Middlesbrough (T. A. Lofthouse); and 30th August (W. Sachse).

Hadena adusta. 26th and 27th June, also 23rd July, near Barnsley, where A. Whittaker generally takes a few specimens each season.

Hadena protea. A beautiful melanic variety of this species, the darkest I have ever seen, taken at Yarm, 26th October, by F. R. Atkinson.

Hadena glauca. Rombalds Moor (Tordoff). Sheffield (L. S. Brady). On moor at Great Ayton, 6th June (W. Sachse). Huddersfield, common (G. T. Porritt).

Hadena suasa. Methley (J. Wigin). One specimen at New Park Spring Wood, 16th June (A. Whittaker).

Xylocampa lithorhiza. Larvæ on honeysuckle, on 2nd June, in Kilton Woods (W. Sachse).

Cloantha solidaginis. Very abundant, Sheffield (L. S. Brady), one collector getting more than 60 one journey, Oakworth Moor, Ilkley, August (T. Fieldhouse). Penistone Moors, two or three specimens, 20th August (A. Whittaker).

Calocampa vetusta. Female at sugar, Middlesbrough (W. Sachse).

Calocampa exoleta. Methley (J. Wigin). Hobmoor, near York, at rest (J. Hawkins). Sugar, Middlesbrough (16th April (W. Sachse). Barnsley (A. Whittaker).

Cucullia verbasci. Larvæ common, Beverley (J. R. Lowther and W. Johnson).

Cucullia umbratica. Methley (J. Wigin). Ingleby Greenhow (F. Elgee). Near Beverley (J. R. Lowther). Common, Barnsley (A. Whittaker).

Heliodes arbuti. Swarmed, Wadworth (L. S. Brady). Edlington (B. Morley).

Brephos parthenias. Abundant at New Park Spring Wood (A. Whittaker).

Abrostola urticæ. Netherwood, near Ilkley, in July (T. Fieldhouse. Barnsley (A. Whittaker).

Abrostola triplasia. Methley (J. Wigin). Huddersfield, common (G. T. Porritt). Saltaire (F. Booth and J. Beanland). Hull (J. Porter). Barnsley (A. Whittaker).

Plusia festucæ. One specimen taken by W. Hewett and one by S. Walker on Sandburn Common, York, where it is decidedly rare.

Plusia gamma. Swarmed at Skipwith (C. D. Ash). Has been in profusion all through the season at Huddersfield (G. T. Porritt). Swarmed in hundreds at privet and almost every flower this year at Sheffield (Cockayne). Swarmed in every lane and garden in the Halifax neighbourhood (E. Halliday). Very common at Saltaire (F. Booth and J. Beanland). Remarkably scarce, they generally swarm here in September, this year I only saw two or three at West Ayton (W. C. Hey).

Plusia interrogationis. One larva at Keighley (F. Booth). Several imagos on Ingleby Greenhow Moors (F. Elgee). Crosshills, near Keighley (W. Feather).

Mania maura. Ingleby Greenhow, 23rd July (W. Sachse). Sugar, Middlesbrough, 22nd August (W. Sachse). Common on 'sugar' by Worsborough Reservoir (A. Whittaker).

Stilbia anomala. Two specimens, 29th and 31st July, at Ingleby Greenhow (F. Elgee).

Euclidia mi. Wadworth (L. S. Brady). Two at Great Ayton, 4th June (F. Elgee). Askham Bogs (Y.N.U. Excursion).

Phytometra ænea. Great Ayton, 4th June (W. Sachse).

CHANGES IN THE HALIFAX FLORA DURING THE LAST CENTURY AND A QUARTER.

SECOND PAPER.

C. E. MOSS, B.Sc.,

Bruton, Somersetshire, late of Halifax.

LAST June in this magazine I discussed the 'Changes in the Halifax Flora during the last Century and a Quarter' [8]. It appears to be necessary to call attention to the limitations, both as to time and place, of the conclusions there drawn. The particular place was chosen because of the opportunities I had had of studying its present flora both in the field and in the records of the local scientific society, and also its past flora as witnessed by lists and herbaria. The particular time was chosen because a century and a quarter ago the first representative list of Halifax plants was published [3]. It was necessary to have some such list to start from, or one could not otherwise be certain of the plants comprising the Halifax flora so far back as 1775. But old lists have many pitfalls; and Bolton's is no exception to this rule. Halifax contains over six hundred vascular plants: Bolton recorded two hundred. It was therefore necessary to give briefly some notions of the principles which appeared to guide him in his selection of this limited number, and also to point out a few errors which he undoubtedly made; otherwise it would have been impossible to draw sound inferences respecting any floristic changes. Such a procedure cannot fairly be described as depreciating Bolton. I feel certain that if such a lover of exactitude as Bolton were still amongst us he would welcome honest criticism, and more particularly so in regard to the least successful of his botanical studies, viz., his Phanerogamic work.* It is not good reasoning to say that because his Cryptogamic work, which was largely original, was sound, that therefore his Phanerogamic work, where he followed other workers, was also accurate. I remember discussing Bolton with the late Mr. Soppitt, who said that while he had nothing but admiration for Bolton in regard to most of his work, yet held that there was no evidence of his ever having been a reliable Phanerogamic botanist. For myself, the strongest argument against the anonymous list of plants in

* I do not here include his water-colour drawings of flowering plants: these are beyond my province.

1901 April 1.

Watson's History of Halifax being Bolton's, is the number of inaccuracies it contains. But even apart from this it cannot yet be said that the Boltonian authorship is established beyond question [9]. Mr. Crossland [14] writing in February last, says of this list that it is 'supposed to be J. Bolton's.'

Now the changes which were found to have taken place in the parish of Halifax during the time specified were practically all due to man's interference with Nature; though it was nowhere stated or implied that, if the survey were extended over a much longer period of time, many natural changes would not be revealed, as such a fact was regarded as obvious. Hence it is not to the point to reply that our moors were prehistorically tree-clad, to quote evidence from late glacial deposits, and to gather examples from all quarters of the British Isles except the particular area to which my conclusions were definitely stated to apply; although all these points are without doubt highly interesting and important in their way. Neither was one much concerned with intra-parochial changes, such as occur when a small garden is enclosed, but chiefly with those changes which had occurred in the parish of Halifax as a whole, with regard to the extinction, the persistence, and the introduction of species. It seemed to me—and the discussion has confirmed me in this opinion—that if such work were done in many areas, some general conclusions would be deducible, which would tend to minimise the vague and unverified ideas which at the present time obtain in the minds of field botanists regarding floristic changes; and I greatly regret that the original and simple issue should have been so beclouded as to render necessary its re-statement.

The question of the possible substitution of *Œnanthe fistulosa* by *Œ. crocata* was very carefully considered, as in Halifax there was a case parallel, in all essential points, with the Adel one [7]. Reasons were given for believing that Bolton erred in his record of *Œ. fistulosa,* and that the plant in the Halifax cloughs then, as now, was *Œ. crocata*; and this position was, if only for a moment, admitted in the 'Rejoinder' [9] to be 'probably right.' Although in June a list of aquatic plants was given, the introduction into Halifax of which was put down to man and his works, yet it was felt that *Œ. crocata* could not be rightly placed in such a category. For all those recently introduced aquatics were noted to be such as inhabited stagnant or slowly moving waters, which in Halifax are only found in the canals and mill dams at the lower levels of the parish, while the

Cowbane is found in the upland cloughs in shallow streams with swift currents and stony beds. Such clough plants were shown, and were admitted to have been, least molested by man, and were almost identical with those of Bolton's time. It is beside the mark to object that the Cowbane is always found at lower levels than the reservoirs at the clough heads, as this, owing to the great increase of reservoirs in late years, almost necessarily applies to clough plants in general, such as *Trollius, Cardamine amara,* and *Stellaria nemorum*; yet who would assert that these plants are not examples of the primitive flora? Some particular stations of *Œ. crocata* can, however, be cited to which the objection does not apply, such as one in Horsebridge Clough, at 900 feet above sea-level, and another at the top of Ogden Clough, 1,200 feet high. It is absurd to speak of substitution here. *Œ. fistulosa,* admitted to be a 'lowland open-marsh' plant, does not occur in rocky clough heads at so great an altitude. There was no need to quote the case of *Typha.* The Reed-mace might replace the Cowbane on an alluvial flat, or at the edge of a dam, but never on a steep, stony hill-side. As well might one expect it to displace the seaweeds in a Sargasso Sea.

It seems to be suggested—though it is difficult to quite catch the meaning of a series of involved, rhetorical questions—that the fact that Bolton mentions not such a fine striking plant as the Cowbane, whereas he recorded an inconspicuous *Mœnchia* is at least some evidence against the presence of the Cowbane in Halifax in 1775. But there are many conspicuous plants besides the Cowbane unmentioned by Bolton, of which I here append a list. Substituting the name of any of these for the Cowbane, the fallaciousness of the above line of reasoning will be at once apparent:—

Ranunculus Flammula, 1862.*
Ranunculus acris, 1844.
Ranunculus repens, 1844.
Cardamine pratensis, 1867.
Lychnis dioica, 1867.
Stellaria Holostea, 1852.
Trifolium pratense, 1867.
Lotus uliginosus, 1831.
Myrrhis odorata, 1833.
Anthriscus sylvestris, 1830.
Heracleum Sphondylium, 1845.
Chrysanthemum Leucanthemum, 1867.
Senecio Jacobæa, 1867.
Senecio aquaticus, 1867.
Cnicus lanceolatus, 1867.
Cnicus palustris, 1867.
Cnicus arvensis, 1867.
Centaurea nigra, 1867.
Crepis paludosa, 1840.
Hieracium Pilosella, 1845.
Hieracium boreale, 1839.
Hypochæris radicata, 1887 (sic).
Leontodon autumnalis, 1867.
Erica tetralix, 1867.

* The date is that of the first Halifax record [See 15].

Lamium Galeobdolon, 1841.
Plantago major, 1844.
Plantago lanceolata, 1844.
Rumex obtusifolius, 1834.
Rumex Acetosa, 1844.
Mercurialis perennis, 1844.
Urtica dioica, 1867.
Tamus communis, 1831.
Allium ursinum, 1867.

This list, lengthy though it is, contains no trees, no shrubs, no rushes, no sedges, no grasses; and species in any sense 'critical' are sedulously omitted. Which all goes to show the unwisdom of attaching significance to the absence of a plant from an incomplete list; and one cannot help expressing surprise that such an elementary pons asinorum should not have been safely crossed by field botanists of wide and varied experience. Some of the dates, e.g., *Hypochæris radicata*, 1887, further suggest that it is always dangerous (pace Mr. Corbett [10]) to argue safely from mere absence of record.

It is highly regrettable that anyone should have felt called upon to 'defend' Bolton: it would be more profitable to endeavour to understand him. Bolton stands in no need of defenders, though it is by no means easy to assess his Phanerogamic work. In my opinion the so-called 'defence' [9] of Bolton was simply a paragraph taken from the 'Rejoinder,' and was really a 'defence' of individual views of Bolton.

It must be further pointed out that if any substitution of *Œ. fistulosa* by *Œ. crocata* has occurred in Halifax, it must have taken place between 1775 and 1815; for by the latter date Leyland [4] had commenced to arrange and date his herbarium. Now Leyland nowhere records *Œ. fistulosa*, while he has a local specimen of *Œ. crocata*. Again Baines [5] in 1844 states that *Œ. crocata* is found 'near Halifax, but throughout the whole of that extensive parish the preceding species [i.e., *Œ. crocata*] does not occur.' This remarkable statement shows that Baines (or more probably the Halifax botanist, probably Gibson, who supplied him with the information, for there is evidence to show that Baines himself did not use Bolton's list) knew of Bolton's record, and thus early in the century had arrived at the opinion that the record for *Œ. fistulosa* could not be accepted.

To me it is not merely surprising, it is altogether inexplicable, that there should be such remarkable and staggering changes in the Halifax flora from 1775 to 1815, and that from 1815 onwards these changes should become quite commonplace and simple of explanation, more especially when we remember that it is in the latter period that the greater changes of plant environment have taken place. I leave it to defenders of

Bolton's infallibility to explain how it is that the first of these periods is marked by a mere list, and the second by several excellent herbaria [4] where, if mistakes did occur, they could usually be detected and put right.

Before leaving the question of the *Œnanthes,* I will quote the opinion of the author of the Halifax flora [15], an opinion which was penned in 1897. Mr. Crump, in summing up the question of Bolton's record of *Œ. fistulosa,* wrote—'There is no later evidence of this species about Halifax, and Bolton's plant was probably *Œ. crocata.* There are undoubtedly a few errors in Bolton's list; and here he may have been misled by Hudson, who limited the distribution of *Œ. crocata* to the south of England.'

It is misleading to argue that Bolton's records are necessarily correct because of his quaint, picturesque, and affectionate style. No one, to my knowledge, has ever questioned Bolton's record of *Hippuris,* even though it is the only one for the district. Questions of distribution are too complicated to be settled by applying any one factor. But the same style is to be noticed in the case of undoubted errors, even in the case of errors admitted in the 'Rejoinder.' Let us consider Bolton's records of *Salix reticulata,* of *Colchicum autumnale,* and of *Carduus acaulos,* all for the Halifax parish. Now, in the case of the *Salix,* Bolton says it was found 'on the top of Norland, Rishworth, and Warley moors, here and there, not plentiful.' In regard to the *Colchicum,* he says it grew 'in meadows about Savile Green, near Halifax, and a few in a Pasture at Hill, in Warley.' In regard to the *Carduus,* he says he had seen it 'in a lane going from Coathill to Warley, also in some rough meadows on the top of Eland park. It is a pretty little Plant.' Yet even the 'Flora of West Yorkshire' [6] does not defend these records. Evidently the argument from Bolton's style—beautiful though the latter be—had better be abandoned.

If there be any who are still prepared to swear by the infallibility of the 1775 list, I ask them to consider the above record of *Colchicum autumnale* for Halifax. The stations are most unlikely. The plant has never been found there since. But *Crocus nudiflorus* was found in the first station early in the century. I found a small and dwindling patch of it in the second station three years ago. *Crocus nudiflorus* is not uncommon in some mid-England districts, where, long before Bolton's time, it was, for some reason difficult to decide upon, introduced from the Pyrenees. The *Crocus,* like the *Colchicum,* flowers in

autumn, when a superficial glance at the two reveals hardly any difference. Many field botanists besides Bolton, and since his time, have recorded the *Colchicum* when they saw the *Crocus*. The mistake is made by field botanists to-day, in spite of good descriptions of both plants. Bolton's text-book, a Hudson [2], did not mention the *Crocus* at all. Well, then, can the conclusion be resisted that Bolton erred in recording *Colchicum*, or are we to have still another case of 'substitution'? Bolton's other work is said by those best able to express an opinion to have been marked by accurate observation. Does that criticism apply here? It is true that Hudson omits any mention of the Crocus; but that fact does not convert 'Stamina Tria' into 'Stamina Sex.' No one to my knowledge has ever suggested that Bolton recorded specimens from his Hudson or his Linnæus [1] without finding them. Did I not say 'his bonâ fides cannot be questioned'? To me the mere fact that his list appeared in 1775 is sufficient apology for his errors. The wonder is, not that he made some mistakes, but that he did not make more. Nor must we rush to the other extreme, and assert that, because of these errors, Bolton's 'memory is not one to be revered.' It was in the knowledge of undoubted limitations and errors that in June last I wrote:—'The list is a peculiar one in many ways; yet his bonâ fides cannot be questioned, nor the value of his list doubted.'

In June, positive evidence was asked for regarding the 'natural short stay' of some plants; and the 'Rejoinder' [9] gives two cases where certain changes followed on the making of water-cuts and the construction of reservoirs respectively! It is difficult to see how even long experience and extended observation can convert into acts of nature such obviously artificial constructions as reservoirs and drains! If by a 'natural stay' was meant after all only an 'artificial stay,' then, of course, it is not surprising that misunderstanding should ensue.

It is not quite clear exactly how I misstated the case in writing of 'the natural changes which species undergo in a given area.' It would doubtless have been better to have used the collective term 'flora' rather than the distributive term 'species'; but after all a flora is composed of species. And besides this, the context clearly showed that the stations of the species, and not their morphological characters, were under consideration. How absurd to think otherwise!

Naturalist,

The following criticism in August, which is placed side by side with my own statement in June, calls for no comment from me:—

> Mr. Moss surely does not contend that, where trippers or what-not exterminate certain plants, no others of different kinds clothe the ground the earlier grew upon! If earth on Beacon Hill top were enclosed as a garden it would ultimately produce Groundsel or small Veronica or other weeds . . . ; if a bigger acreage were fielded, Cleats, Docks, and Thistles would soon be in evidence where none were apparent before.
>
> [Nat., Aug. 1900, pp. 230-1.]

> The changes incident to tillage operations often bring about changes of flora.
>
> [Nat., June 1900, p. 173.]

Some doubt was raised regarding my views of the Halifax moors. As I intend shortly publishing an article dealing with this question in some detail, I will here only briefly refer to the matter. To state (vide the 'Rejoinder') that smoke 'must be' a very minus quantity there, is a mere ipse dixit. Let us picture the view of the Lancashire towns as one stands on some of the bold western escarpments of the Pennines, say from Blackstone Edge or Gorple Stones. Deadly suburban fields form the most extensive element of the background; but what rivet the eye are the scores, and scores again, of mill chimneys, tall, straight, and lank, belching forth volumes of black, dense smoke straight at the rocks on which we stand! Rochdale, Littleborough, Bacup, Burnley, Nelson, Colne—each contributes its quota, for from them, i.e., from the west, the wind blows for nine months out of the twelve; and, during the remaining three, Huddersfield, Halifax, Sowerby Bridge, Hebden Bridge, Keighley, Bradford, effectually maintain a continuous supply. Swill Hill is well-nigh permanently embedded in a smoke cloud, being only three and a half miles south-east of Manningham Mills, Bradford, on the one hand, and the same distance north of Dean Clough Mills, Halifax, on the other. Further, given a clean expanse of white snow to begin with, and a driving south-west drizzle to follow, and even on the remotest moors of Halifax, the whole of this clean sheet is in two or three hours palpably blackened. This is testified by resident farmers and keepers, and borne out indirectly by Mr. A. Wilson [12] in his paper at the meeting of the British Association last year. Mr. Wilson says: 'The great smoke drift from South and East Lancashire could be seen crossing over the Pennine Range of

moorlands and then mingling with the West Riding smoke.' 'Examples of 'black rain' at considerable distances from large towns are well known.' So high an authority on the subject as Dr. Cohen [13] emphasises the fact that this great smoke cloud lessens the amount of bright sunshine and reduces the temperature, even at some distance from the towns. It was not stated in June that the influence of smoke on moorland vegetation was more than subsidiary, but it is—and I have studied the question on the spot—more than a 'dummy enemy.'

It is no doubt easy to exaggerate the influence of the firing of the moors: it would appear no more difficult to minimise the same. Keepers from Scotland and from Yorkshire assert that firing increases the heather and bilberry, and keeps down grasses and sedges. A well-burnt moor consists almost solely of heather. The late Mr. Robert Smith [11]—whose loss to British field botany is as regrettable as it is calamitous—also gives the firing of the moors as one factor in accounting for the increase of heather and for the disappearance of rare moorland plants. This factor was not stated in June to be more than secondary in importance. It is not easy for anyone to faithfully describe a district with which he is personally unfamiliar; and a detailed botanical survey of the south-west Yorkshire moors shows me that the attempted description of them in August [9] as 'occupied by millions of well-rooted Callunas and Vacciniums' is inapplicable to more than half of these extensive tracts. Over the bulk of the Halifax moors these 'millions of well-rooted Callunas' are conspicuous by their absence; and the 'millions of well-rooted Vacciniums' are decidedly dwarfed and comparatively scarce!!

It is difficult to express any opinion on the general question, as the position sketched in February is not the one stated in August. In February [7] we were informed that 'as some species die out naturally, others, as naturally, take their forerunners' place'; and the occurrence of *Œnanthe crocata* at Adel was given as a case in point, it being looked upon as a supposititious substitution of *Œ. fistulosa*. We were informed in February that 'the natural stay of species may be long or short,' the supposititious stay of *Œ. fistulosa* at Adel being the chosen illustration! I admitted in June that there were no doubt exceptional cases of this 'natural short stay,' and positive evidence of authenticated cases was asked for, but unfortunately not supplied. In August [9], however, the general position was moved. We were then told that 'as conditions alter, so, slowly, does the flora of

a tract undergo concurrent variation'; with which trite dictum all botanists, whether young or old, must of course coincide. It was with the theory as stated in February, when it was doubtless in 'the adolescence of demonstration,' that one 'quarrelled with the Deduction'; but as in August it had taken a decided step towards virility, one feels most happy in then 'furnishing overwhelming witnesses to the facts leading to it.'

I do not deny that the 'substitution' of one plant by another occurs: I have simply asked for evidence of a non-supposititious character. I am prepared to grant that 'substitution' by natural means occurs; and that, could we find continuous and reliable records over some centuries, examples would be not rare; but it seems to me that such examples are difficult to find if we only extend our observations over a short period of time. No doubt 'substitutions' by artificial agencies are much more numerous, and comparatively easy to find even in the course of observations extending only over a few decades.

1. Linnæus, Spec. Plant., 1753.
2. William Hudson, Flor. Angl., 1762.
3. (James Bolton), Catal. of Halif. Plants; Hist. of Halif., by Rev. Jno. Watson, M.A.
4. R. Leyland, Herbm., in Museum, Halif., 1815, et seq. ann.
   S. Gibson, Herbm., in Museum, Halif., 1830, et seq. ann.
   S. King, Herbm., in Museum, Halif., 1830, et seq. ann.
5. Henry Baines, Flora of Yorks., 1844.
6. F. A. Lees, Flora of West Yorks., 1888.
7. F. A. Lees, Old Leeds Herbary, Nat., Feb. 1900.
8. C. E. Moss, Changes in Halif. Flora, Nat., June 1900.
9. F. A. Lees, Defence of J. Bolton, Nat., Aug. 1900.
   A Rejoinder, Nat., Aug. 1900.
10. H. H. Corbett, Note in Nat., Sept. 1900.
    Rev. W. Fowler, Note in Nat., Oct. 1900.
11. R. Smith, Botan. Surv. of Scotl., I., July 1900.
    Botan. Surv. of Scotl., II., Aug. 1900.
12. A. Wilson, Smoke Cloud of N. of Eng., Brit. Ass., Sept. 1900.
13. J. Cohen, Air of Towns, Brit. Ass., Sep. 1900.
14. C. Crossland, Note in Halif. Nat., Feb. 1901.
15. W. B. Crump, Flora of Halif., Halif. Nat., unfinished.
16. F. A. Lees, Note in Nat., March 1901.

[This—the final reply—closes the discussion.—Eds. Nat.]

1901 April 1.

NOTES on LEPIDOPTERA.

Cleveland Lepidoptera.—The following species should have been included in my list sent to Mr. Hewett, but as the insects were then unidentified I was unable to do so:

Noctua rhomboidea.—A specimen of this local species was taken on sugar, 30th July 1899, at Ingleby Greenhow.

Larentia salicata.—One near Great Ayton, 20th May 1900.

A single worn individual of *Thera juniperata* on elm trunk, near Middlesbrough, on 8th October. The presence of this species here is somewhat of a mystery, as there is no juniper nearer than several miles away. My own belief is that the moth had been blown from its haunts, as the weather at the time was very windy.—FRANK ELGEE, 23, Kensington Road, Middlesbrough, 1st March 1901.

We doubt if the *T. juniperata* was *blown* to Middlesbrough; more likely it was introduced on a railway carriage or wagon.—G. T. PORRITT.

Life-History Notes. *Arctia caja* (the Tiger Moth).—On the 9th July 1900 I bred my first specimen about 1 p.m. Whilst looking in breeding cage (out of doors), containing cocoons of *A. caja*, I heard a slight sound and found it proceeded from a cocoon of this species; the pupa had cracked, and in a quarter of an hour out came the moth, and by 1.25 p.m. its wings were fully expanded.

A fine and large female specimen of *Arctia caja*, which had copulated with a *very* small male, laid 230 eggs in a cluster on 4th August 1900, and 30 more by 8th August, and from the 8th to the 21st, whilst I was away in Paris, this same female laid a further batch of 357 eggs; total 617 eggs. The first batch of about 46 larvæ hatched 21st August from the 357 lot and not from the first lot of eggs laid, as these had been forwarded to Mr. Geo. Parkin, of Wakefield, on 8th August, to photograph.—WILLIAM HEWETT, York, 22nd March 1901.

Life-History Notes. *Odonestis potatoria* (the Drinker Moth).—I noticed that this species emerged in my breeding cage (out of doors) at all hours of the day, but mostly from 7 to 9 p.m., the latter hour being just the time when the species commences its flight.

A female *O. potatoria* laid 60 eggs in 40 minutes on 25th July 1900, from 9.30 p.m. to 10.10 p.m.

On the 1st July the first specimen emerged.

On the 14th July I took a newly-emerged female to Askham Bogs and tried to 'assemble,' but although two males came up and hovered round the gauze cage containing the female they did not stop, but soon flew away, 'never to return again.' This would be between 9 and 9.30 p.m.

I found that the common or garden variety of the domestic cat had a great liking for large newly-emerged moths; it or they had removed the covers of several pots containing newly-emerged specimens, and had eaten part only of some of the moths, i.e., *Arctia caja* and *Smerinthus ocellatus.*—WILLIAM HEWETT, York, 22nd March 1901.

***Chelonia plantaginis* at Harden Moss, near Huddersfield.**—I should like to augment Mr. Hewett's list of 'Lepidoptera in 1900,' as printed in last month's 'Naturalist,' by recording this species—the Wood Tiger—from a locality where its occurrence is very rare. I saw a solitary specimen on Harden Moss on the 28th June, on the occasion of the visit of the Yorkshire Naturalists' Union to this neighbourhood. I failed to capture the specimen, as a strong wind was blowing at the time, and I had not then adjusted my net—having only just entered the Moss—and by the time that implement was in working order the moth was far away; but of its identity I am certain, since I got within a yard of it as it momentarily settled on a bare patch of ground. Though previously common and even yet occasionally found in other parts of the district, *C. plantaginis* has but once before been recorded from Harden Moss, viz., 14th May 1892, when my father—Mr. S. L. Mosley, F.E.S.—found a larva there. No account having been published in the 'Naturalist' of the excursion alluded to, the record has not been printed in that magazine, but it is recorded in the 'Naturalists' Journal,' Vol. 9, p. 124.—CHAS. MOSLEY, The Museum Press, Lockwood, Huddersfield, 12th March 1901. Naturalist.

LINCOLNSHIRE NATURALISTS AT SCUNTHORPE.

HENRY PRESTON, F.G.S.,

Hawthornden Villa, Grantham; Geological Secretary to the Lincolnshire Naturalists' Union.

CONSIDERABLE interest was manifested in the joint meeting of the Lincolnshire with certain members of the Yorkshire Naturalists' Union, which was held at Scunthorpe, on Bank Holiday, 6th August. Notwithstanding that the weather had been very unpromising for several days previous to the meeting, a goodly number of ladies and gentlemen were attracted to this most promising district for a day's field work. Various sections for botanists and entomologists were formed, which branched off from the main party at different points to make search for specific finds; most of them with definite results, as will be seen from the reports sent in.

Early in the forenoon the geological party visited the boring which is being made into the New Red Sandstone for a water supply for Scunthorpe and the neighbourhood. Here Mr. Cobban, engineer in charge of the works, gave an account of the work in progress, with full particulars of the bore up to date. Mr. Preston took up the tale, and made some remarks on the interesting variety there is in the geology of North Lincolnshire compared with the same rock formations in the Southern half of the county.

To geologists and water engineers in particular there is no rock system in the whole geological series so full of interest as the sands and pebble beds of the Bunter and Lower Keuper formations of the New Red Sandstone. It is doubtful whether in the whole country we have a gathering ground capable of yielding a larger and purer supply of water than these beds. The nature of the formation itself insures its purity, while the absence of limestone in the beds through which the water has to percolate insures its comparative softness. The great thickness of the beds, together with its large extent of outcrop, enable the Bunter to yield the vast quantities of water which are daily being drawn from it over such an extensive area of country.

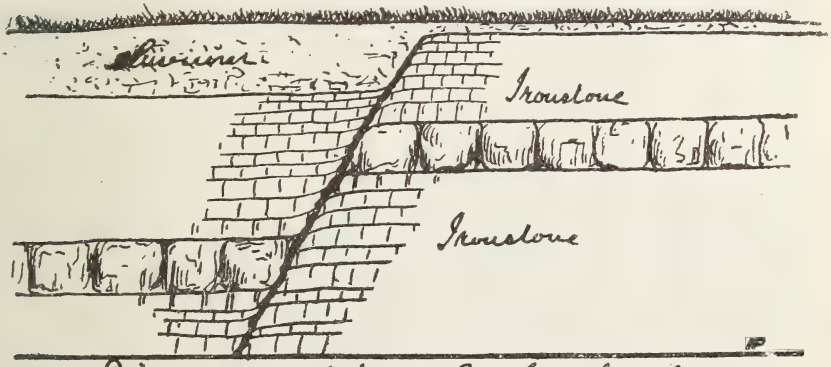
The Scunthorpe bore is situated at the foot of the Liassic escarpment, to the west of the town. The well is 24 feet deep and 8 feet in diameter, and the bore pipe 18 inches across. The diameter of this pipe will be reduced as the depth increases;

and it will be discontinued when the Keuper Marls pass wholly into the New Red Sandstone, when the bore will be 10 inches across. Geologically the bore section is of great interest, seeing that, after passing through about 19 feet of alluvium, the Rhœtic beds were touched at their outcrop, at the foot of the cliff. The section was but a few inches thick, and occurred only on the east side of the well; but the black shales and pyritous bed with coprolites and small fragments of what appear to be fish spines or teeth were quite sufficient to fix the horizon of these interesting beds. The cores brought up after passing the Rhœtics consisted of red and blue marls, with varying amounts of gypsum, which continued down to 676 feet, the depth of bore at the time of visit. It is intended to sink to a depth of 1,600 feet, so as to penetrate some 700 feet or more into the Bunter Sandstone. There is no doubt that when the bore and works are finished this district will have an excellent and abundant supply of water, and the visitors were extremely pleased that Mr. Cobban had given them the opportunity of seeing the work now in progress. Walking from this bore-hole in an easterly direction the party climbed the escarpment, about 150 feet high, formed by the limestone beds of the Lower Lias, and examined an interesting section, 17 feet deep, for the new gas works. This section is in the Gryphæa Zone, a sub-zone of the Bucklandi zone of the Lower Lias; and the characteristic fossils—*Gryphæa incurva, Ammonites bucklandi, Lima gigantea,* etc.—were found. Proceeding thence through the town various points of outcrop of the Ironstone were shown, and a visit was made to the Trent Ironstone Mines, where a face of workable ironstone 20 feet thick was seen. The ironstone is overlaid directly by sands and peat, but in one part of the pit a section of the clay was also seen which comes immediately above the ironstone. In this clay numerous concretionary nodules occur which are interesting to the fossil collector, many of them containing Ammonites and other fossils in a good state of preservation. Numerous fossils occur in the ironstone, and a good list were noted, including *Ammonites semicostatus, A. conybeari, A. bucklandi, Belemnites, Pleurotomaria anglica, Nautilus, Cardinia listeri* and two other species, *Pholadomya ambigua, Lima gigantea, L. pectinoides, Pecten æqualis, P. æquivalvis, Gryphæa incurva, Rhynchonella, Spiriferina walcotti,* crinoid stem, *Ichthyosaurus* (vertebra), and fossil wood.

The ironstone forms the upper part of the Bucklandi Zone and is styled the Semicostatus Zone because of the prevalence of

this Ammonite in the beds. It presents many features of great interest. Its geological position has been mentioned and many of its fossils given; but its mode of origin is always a problem, and causes a certain amount of doubt and difficulty. The lower unweathered beds of the stone are blue and contain $FeCO_3$, whilst the upper and fully-weathered beds have the iron in the form of peroxide (Fe_2O_3). Also the fossils in the lower beds are often changed into carbonate of iron, proving that the carbonate is a subsequent addition to the original formation. Hence it would appear that the rock, as originally deposited, was an ordinary limestone, that subsequently, probably when buried deep in the earth's crust, carbonate of iron (the soluble form of iron) entered the bed and was deposited either directly or as a

Fig I



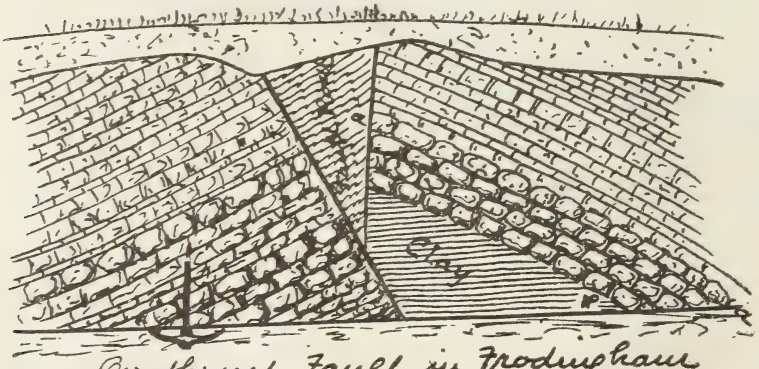
Diagrammatic section of Faull in Ironstone at Scunthorpe (Semicostatus Zone, Lower Lias)

partial transference into the limestone; and that upon elevation into a position to receive atmospheric influences the carbonate became changed into oxide, and the useful ore produced. The programme of the day had included much fossil collecting in this pit and the examination of some higher beds in the series, but the continuous downpour of rain had made the pit impassible, and work impossible, therefore it was decided to end the excursion here. When, however, the returning party reached Winteringham Road, a few of the hardiest enthusiasts decided, notwithstanding the still pouring rain, to accompany Mr. Preston and visit a fault in the ironstone at the Midland Ironstone Mines, about a mile away. This geological feature well repaid a visit. It is a normal fault striking across the ironstone in a

N.N.E.—S.S.W. direction; its hade is towards the south at an angle of 70°; the displaced beds are well seen, and the throw of 6 feet easily measured. On the E. side of the pit the bottom wall of the fault was bared for 6 or 8 feet in width, and the whole surface was seen to be beautifully slickensided. A most interesting point about the fault was the fact that the upthrow side had not been planed off level at the surface with the downthrow side as is usually the case, but projects about 5 feet above it. This suggests that the fault is of comparatively recent formation; that it is caused by the sinking of the downthrow side; and that the surface has been gradually filled in with eluvium or wind-drift of the usual character (blown sand, etc.), so as to keep the land surface level.

In further illustration of the manner in which the ironstone is here faulted, the remains of an overthrust or reversed fault were visited. Its chief characteristics had been removed by working the stone, but from a photograph lent by Mr. John Long, of Scunthorpe, we take the interesting illustration.

Fig II



Overthrust Fault in Frodingham Ironstone.

The bed 'a' marks the lower limit of the worked ironstone, the blue stone coming below this being worked only for special purposes. The 'clay' which has been thrust up is the 'blue shales' which comes immediately beneath the ironstone bed.

From this place it was intended to visit what is locally known as the 'Sunk Church,' a geological feature in the near neighbourhood, but the weather won the day, and the rain-saturated party reluctantly left this most interesting formation for a future visit.

The Revs. W. Fowler and W. W. Mason made a list of 246 species and varieties of plants between Frodingham Station and the Viaduct Common, and from Crosby Black Rabbit Warren. The best records were these :—

Erysimum cheiranthoides.
Diplotaxis muralis.
These are both aliens, and the latter grows by thousands in the iron workings.
Radiola linoides.
Genista anglica.
Drosera rotundifolia.
Erigeron acris.
Carduus crispus × nutans.
Gentiana Pneumonanthe.
The colour form flore albo was not taken on this occasion.
Lycium barbarum and Rosa rubiginosa are garden escapes.
Cynoglossum officinale.
Scleranthus annuus.
Myrica Gale.
Epipactis palustris.
Narthecium ossifragum.
Calamagrostis epigeios.
Calamagrostis lanceolata.
Chenopodium rubrum.

The Rev. W. Fowler reported that one Hepatic was found, *Marchantia polymorpha*, with good fruit on some fronds, and gemmules on others; and that the following Fungi were collected :—

Lycoperdon giaganteum.
Bovista plumbea.
Bolbitius tener.
Hygrophorus conicus.
Marasmius oreades.
Mycena sanguinolenta.

Mr. J. Eardley Mason wrote that his take of bugs was very scanty, the following being all that occurred :—

Tropicoris rufipes L.
Lygus contaminatus Fall. Off Birch.
Phytocoris pini Kbm. Off Scotch Fir, one.
Phytocoris tiliæ Fab.
Cyllocoris histrionicus L.
Orthotylus ochrotrichus D.&S. One ♂.
Orthotylus prasinus Fall.

The Rev. A. Thornley took an Acarid or Mite, *Phytoptus myrideum*, from the galls on the maple leaves. It is of the same genus as the *Phytoptus ribis*, which causes the flower-buds of the black currant to form cabbage-shaped heads.

The Rev. A. Thornley, M.A., F.L.S., F.E.S., reported :—Threatening weather in the morning; and wind and rain in the early afternoon quite extinguished any entomological hopes. Nevertheless a little collecting was done on the perfectly ideal ground, and the results obtained showed what a magnificent promise awaited collectors, but a promise, alas! left unfulfilled through the untoward weather.

NEUROPTERA.

Lestes sponsa. One ♀.
Sympetrum striolatum. One ♀.

ORTHOPTERA.

Stenobothrus bicolor.
Stenobothrus parallelus.
Gomphocerus maculatus.
Forficula auricularia (Earwig).

COLEOPTERA.

Harpalus rufipes.
Calathus flavipes.
Pristonychus terricola.
Leistus ferrugineus.
Colymbetes fuscus.
Ocypus olens.
Lagria hirta.
Crepidodera ferruginea.

HETEROPTERA (BUGS).

Calocoris bipunctatus.
Phytocoris longipennis.
Nyssius thymi (under plants of Erodium).
Peritrechus luniger (under plants of Erodium).
Aphrophora alni.
Philænus spumarius.
Cixius nervosus.

HYMENOPTERA.

Bombus terrestris.
Bombus hortorum, with one example of the entirely black var. harrisellus.
Bombus agrorum.
Vespa germanica.
Vespa sylvestris (visiting as usual flowers of Scrophularia aquatica).
Andrena denticulata. One ♂.
Halictus cylindricus. ♂.
Sphecodes gibbus. Two ♂s.
Mellinus arvensis. One ♂.
Dolerus pratensis.

DIPTERA.

Eristalis arbustorum.
Eristalis pertinax.
Eristalis tenax.
Eristalis horticola.
Syrphus ribesii.
Syrphus luniger.
Syrphus balteatus.
Platichirus albimanus.
Melanostoma mellinum.
Sphærophoria sp.
Syritta pipiens.
Rhingia rostrata.
Cyrtoneura stabulans.
Leptis sp.
Chloromyia formosa.
Oliveria lateralis.
Thereva (plebeia?).
Siphona geniculata.
Tetanocera reticulata.
Pedicia rivosa.

LEPIDOPTERA.—The bad weather quite prevented anything much being done in this order. Some of the members, however, obtained some fine larvæ of the Eyed Hawk Moth (*Smerinthus ocellatus*); and a beautiful larva of an *Acronycta*, I think, was found on willow. In many places the ragworts were entirely stripped of their leaves by the larvæ of the Cinnabar Moth (*Euchelia jacobææ*). The following common butterflies were noted:—The Meadow Brown, Gatekeeper, Small Heath, Green-veined White, and Small Copper. Also the following moths:—*Eubolia mensuraria*; *Abraxas grossulariata* (Currant Moth); *Pyrausta purpuralis*, but very worn; and a small *Plume*. Mr. Preston greatly interested the company at tea-time by exhibiting a huge larva of the Death's Head Hawk Moth (*Acherontia atropos*), a species which seems to be rather common this year. The same gentleman also exhibited from the Grantham district *Sirex gigas*, a very fine sawfly, found boring into pine logs; and the following interesting Coleoptera, taken by Mr. Worsdale at Grantham: *Cychrus rostratus*, *Cassida nobilis*, *Serica brunnea*, *Athöus niger*; also an interesting bug, *Sehirus bicolor*.

The following Mosses were taken by the Rev. W. W. Mason:—

Polytrichum gracile Dicks.
Ceratodon purpureus Brid.
Tortula ruraliformis Dixon (rarely found inland).
Mnium undulatum L.
Brachythecium purum Dixon.
Amblystegium filicinum DeNot.
Hypnum cuspidatum L.

NOTTINGHAMSHIRE COLEOPTERA: I. GEODEPHAGA.

Rev. A. THORNLEY, M.A., F.L.S., F.E.S.,
Vicar of South Leverton, Notts.,
AND
W. E. RYLES, B.A., F.E.S.,
Nottingham.

The following list of 133 species of Geodephaga found in this county represents about twelve years' work on the part of the authors and their friends. They do not intend by this statement to imply that it is exhaustive, for, owing to want of workers, the chief collecting has been done around the centres of Nottingham and Retford, a somewhat fortunate circumstance, as these places represent approximately the extreme ends of the county, in the South-west and North-east. It is believed, therefore, that the lists from these localities, when combined, will furnish a good account of the Coleoptera occurring in the whole of the county. The most important intermediate stations are Newark, Mansfield, and Sherwood Forest. A very valuable collection of Coleoptera was made in the first-named place by the late Mr. Hadfield, but few of the specimens were labelled, and so many records were lost. Canon Fowler, however, informs me that a great many of Mr. Hadfield's best captures are recorded in the 'British Coleoptera.' Both at Mansfield and Newark, however, some collecting has been done, as indeed at many other places in the county. From Sherwood Forest, that Midland 'Mecca' of collectors, innumerable records have been obtained; but, whilst these deal chiefly with rare and even unique insects, the commoner species have scarcely been noted. Now the distribution of many of these is very interesting and remarkable, and a local list, if carefully drawn up, exemplifies it well. If we take, for example, a small species of *Pterostichus*, viz., *P. diligens* Sturm, we shall find it usually described as common and widely distributed; but so far, in our county, in spite of much seeking, we are only able to record two undoubted examples. Its close ally, *P. strenuus* Panz., abounds. We have thus to reverse the opinion expressed in the 'British Coleoptera,' Vol. I., p. 66. If this were an isolated instance it might be supposed that some mistake had been made, but as we both have taken *P. diligens* in other parts of Great Britain, it is no stranger to us. Moreover, our list, as it is published, will

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again and again point the fact, that too much has been assumed about the distribution of many insects, as some of the so-called 'common species' will prove much more local than was supposed.

There are many friends who deserve not only our thanks, but the thanks of all naturalists, for their perseverance in collecting specimens. To Mr. Stephen Pegler, the present Mayor of Retford, our thanks are specially due, for much thorough and energetic work in the Retford district. To Prof. Carr, M.A., F.L.S., Mr. Sturges Dodd, and the young members of the Nottingham High School Naturalists' Society, thanks are greatly due for a large quantity of material. And lastly, to Mr. W. Denison Roebuck, Editor of 'The Naturalist,' the authors are indebted for much encouragement and many bibliographical references. The mention of these names does not exhaust the list of our kind helpers, but each will be recognised either under his initial, or, if a less frequent contributor, by his name appended to the record.

We had hoped to have compared our Coleopterous Fauna with that of the neighbouring counties, but, with the exception of Yorkshire, the county lists are either only partial, or still in a very unprepared condition. It may, however, be possible to complete this set of papers by a final one on this subject of comparative Faunas.

In Messrs. Sharp and Fowler's Catalogue 307 species of Geodephaga are recognised. In the present list 133 are recorded, that is about 43 per cent. By studying the notes on distribution in several well-known works on British Coleoptera, we have come to the conclusion that further search will probably add about 19 more species, thus bringing up the total to about 152 species, practically about 50 per cent., and it is probable this is a fair average for an inland county.

GEODEPHAGA.

Cicindela campestris L. Langford Moor, Newark, common, 29th June 1899 (A. T.); Clumber Park (S. Pegler).

Cychrus rostratus L. Aspley Woods, Nottingham (W. E. R.); Woodborough Road, Nottingham (Freestone).

Carabus catenulatus Scop. Sherwood Forest (Freestone).

Carabus nemoralis Müll. Retford district, not uncommon (A. T.); Nottingham district, common (W. E. R.).

Carabus violaceus L. Retford district, moderately common (A. T.); Nottingham district, not uncommon (W. E. R.).

Carabus granulatus L. Retford (S. P.); Widmerpool (W. E. R.); Beeston (Pope and Freestone).

Carabus monilis F. Nottingham district, 1899 (S. D.); Treswell (A. T.); Retford (S. P.); Hoveringham and Chilwell (W. E. R.).

Notiophilus biguttatus Fab. Apparently common throughout the county.

Notiophilus substriatus Wat. Nottingham, one example (W. E. R.); South Leverton, a few (A. T.).

Notiophilus quadripunctatus Dej. An example of this doubtfully distinct species was taken in the Nottingham district by Mr. Ryles; also one example taken by Mr. Thornley at Leverton. It differs in no respect from *N. biguttatus,* save in the possession of four somewhat irregular punctures on the elytra.

Notiophilus aquaticus L. Appears to be nothing like so common in the county as the next species; Treswell (A. T.); West Bridgeford (Freestone).

Notiophilus palustris Duft. Retford district, rather common (A. T.); Nottingham district (W. E. R.).

We may note that Mr. Thornley has taken the only remaining British species, *N. rufipes* Curt., just outside the county, on the banks of the Trent, making it probable that the whole genus will be found in Notts.

Leistus spinibarbis F. Retford district (S. P.); Nottingham district (W. E. R.).

Leistus fulvibarbis Dej. Uncommon, Retford district (S. P.); Nottingham district (W. E. R.).

Leistus ferrugineus L. South Leverton (A. T.); Retford (S. P.); Strelley (W. E. R.); Barton-in-Fabis (W. E. R.); Colwick (W. E. R.).

Leistus rufescens F. Nottingham and Strelley (W. E. R.).

Nebria brevicollis F. Common in the Retford and Nottingham districts. There is probably a very early reference to this species in the 'Entomological Magazine' for April 1833, pp. 285-286, by Ed. Newman. Under the name *Helobia lata* is described a new species taken in considerable numbers in the neighbourhood of Nottingham by Dr. Howitt. In 'Stephens' Manual' this evidently reappears as *H. varicornis* Newman. There is little doubt but that this was only a variety of *N. brevicollis.*

Nebria gyllenhalii Sch. Nottingham district, one example, 1898 (S. P.).

Blethisa multipunctata L. South Leverton (S. P.); Nottingham (W. E. R.); Beeston (W. E. R.).

Elaphrus riparius L. Cottam, river bank (A. T.); Retford district (S. P.); Nottingham district (W. E. R.).

Elaphrus cupreus Duft. South Leverton (A. T.); Retford (S. P.); Nottingham (W. E. R.); Barton-in-Fabis (W. E. R.).

Loricera pilicornis F. Retford district, common (A. T.); Nottingham district (W. E. R.).

Clivina fossor L. Littleborough, Cottam, Retford, South Leverton (A. T.); Nottingham district (W. E. R.).

Clivina collaris Herbst. One example, Nottingham (W. E. R.).

Broscus cephalotes L. In October 1895, Mr. Stephen Pegler discovered a colony of this shore-loving species in a sandy tract near Retford Railway Station, at Ordsall (see Ent. Monthly Mag., October 1895, p. 240).

Badister unipustulatus Bon. Newark (Fowler, Brit. Col., Vol. I., p. 30).

Badister bipustulatus F. South Leverton, not uncommon (A. T.); Nottingham district, not uncommon (W. E. R.).

Badister sodalis Duft. Aspley (Nottingham), by shaking tufts of grass, one example, 4th October 1899 (W. E. R.).

Licinus depressus Payk. A single example in Sherwood Forest (W. E. R.). This is a most interesting record as the species occurs chiefly on the chalk in the South of England, though reported from the Durham coast by Mr. Bold as 'very rare' (see Fowler, Brit. Col., Vol. I., p. 31).

Chlænius nigricornis F. Nottingham, banks of Trent (Pope); Beeston and Barton-in-Fabis (W. E. R.).

Acupalpus dorsalis F. Stapleford Common, near Newark (Fowler, Brit. Coleop., Vol. I., p. 38). The locality thus cited must be taken with reserve, for a large portion of the district thus signified lies outside the county of Notts., and is in the county of Lincoln.

Acupalpus exiguus Dej. var. ***luridus.*** South Leverton (S. P.).

Acupalpus consputus Duft. There is an early record, 'near Newark,' in plenty (J. F. Dawson in Ent. Ann., 1856, pp. 65-81). The note above on these Newark localities must be borne in mind.

Acupalpus meridianus L. Nottingham (W. E. R.).

Bradycellus placidus Gyll. Treswell Wood (A. T.); Grove (S. P.).

Bradycellus distinctus Dej. By sweeping grass near Treswell Wood (A. T.); Clumber (S. P.).

Bradycellus verbasci Duft. Treswell Wood, not uncommon (A. T.).

Bradycellus harpalinus Dej. Retford district (A. T.).

Bradycellus similis Dej. Brodholme (S. P.).

Harpalus punctatulus Duft. Burton Joyce, several examples (W. E. R.); Newark (Fowler, Brit. Col., Vol. I., p. 45).

Harpalus azureus F. Edwalton and Burton Joyce (W. E. R.).

Harpalus rufibarbis F. South Leverton, not uncommon (A. T.); Retford (S. P.).

Harpalus puncticollis Payk. Nottingham district (W. E. R.).

Harpalus ruficornis F. Retford district, common (A. T.); Nottingham district, common (W. E. R.).

Harpalus æneus F. Retford district, common (A. T.); Nottingham district, common (W. E. R.).

Harpalus tardus Panz. Nottingham district, June 1899 (S. D.); Sutton, near Retford (S. P.); Sherwood Forest (W. E. R.).

Stomis pumicatus Panz. South Leverton, not uncommon under stones (A. T.); Nottingham district, not uncommon (W. E. R.).

Platyderus ruficollis Marsh. Nottingham; Lambley; Clifton Grove (W. E. R. and others).

Pterostichus cupreus L. South Leverton, common in spring (A. T.); Nottingham district, not uncommon (W. E. R.).

Pterostichus versicolor Sturm. South Leverton, but much less common than the last (A. T.); Nottingham district, also less common than *P. cupreus* (W. E. R.).

Pterostichus madidus F. Retford district, common (A. T.); Nottingham district, common (W. E. R.).

Pterostichus niger Schall. South Leverton, common (A. T.); Cresswell Crags (A. T.); Nottingham district, common (W. E. R.).

Pterostichus vulgaris L. Retford district, common (A. T.); Nottingham district, common (W. E. R.).

Pterostichus nigrita F. Retford district (A. T.); Nottingham district, common in early spring in flood refuse by Trent (W. E. R.).

Pterostichus minor Gyll. Cottam (S. P.).

Pterostichus strenuus Panz. Retford district, common (A. T.); Nottingham district, common (A. T.).

Pterostichus diligens Sturm. Nottingham, one example, by Trent, March 1890 (W. E. R.).

Pterostichus picimanus Duft. South Leverton (A. T.); Nottingham (W. E. R.).

Pterostichus inæqualis Marsh. Newark (Fowler, Brit. Col., Vol. I., p. 67).

Pterostichus vernalis Gyll. Nottingham (W. E. R.); Burton Joyce and Beeston (W. E. R.).

Pterostichus striola F. South Leverton, not uncommon (A. T.); Nottingham district, not uncommon (W. E. R.).

Amara fulva DeG. Nottingham district (W. E. R.).

Amara apricaria Sturm. Sherwood Forest (Golding); Retford district, common; Nottingham district, common (W. E. R.).

Amara consularis Duft. Nottingham, two examples (W. E. R.).

Amara aulica Panz. Retford district (A. T.); Nottingham district (W. E. R.).

Amara livida F. Bulwell (W. E. R.).

Amara ovata F. Radcliffe and Hazelford (W. E. R.).

Amara similata Gyll. Bulwell (S. D.); Nottingham (W. E. R.); Leverton (A. T.); Retford (S. P.); Colwick and Hazelford (W. E. R.).

Amara acuminata Payk. South Leverton (A. T.); Nottingham (J. W. Carr).

Amara tibialis Payk. Grove (S. P.); Nottingham (W. E. R.).

Amara familiaris Duft. Retford district, common; Nottingham district, common (W. E. R.).

Amara trivialis Gyll. Retford district, not very common (A. T.); Nottingham district, not uncommon (W. E. R.).

Amara communis Panz. Nottingham district (W. E. R.); Retford district (A. T.).

Amara continua Thoms. Nottingham district (W. E. R.).

Amara plebeia Gyll. Retford district (A. T.); Nottingham district, not uncommon (W. E. R.).

Calathus cisteloides Panz. Retford district, common (A. T.); Nottingham district, common (W. E. R.).

Calathus fuscus F. Babworth (Retford), a single example taken by Mr. Stephen Pegler in 1897.

Calathus flavipes Fourc. Nottingham (W. E. R.).

Calathus melanocephalus L. Retford district, common (A. T.); Nottingham district, common (W. E. R.).

Calathus piceus Marsh. Sherwood Forest (W. E. R.); Nottingham and Radcliffe (W. E. R.).

Taphria nivalis Panz. South Leverton (A. T.); Retford (S.P.); Sherwood Forest (W. E. R.).

Pristonychus terricola Herbst. Scofton (A. T.); Nottingham (A. T. and W. E. R.); Retford (S. P.).

Anchomenus angusticollis F. Retford district (A. T.); Nottingham district, common (W. E. R.).

Anchomenus dorsalis Müll. Retford district, common (A. T.); Nottingham district, common (W. E. R.).

Anchomenus albipes F. Rampton (A. T.); South Leverton (A. T.); Nottingham district, common (W. E. R.).

Anchomenus oblongus Sturm. Worksop (W. E. R.).

Anchomenus marginatus L. Beeston, Radcliffe, Nottingham (W. E. R.); Barton-in-Fabis (Pope); Newark-on-Trent (Fowler, Ent., April 1881, p. 91).

Anchomenus sexpunctatus L. Newark, near Stapleford Common (Fowler, Brit. Coleop. I., p. 90). Possibly excomitate. See earlier note on Newark localities.

Anchomenus parumpunctatus F. Retford district, common (A. T.); Nottingham district, not uncommon (W. E. R.).

Anchomenus viduus Panz. var. ***mœstus*** Duft. South Leverton, not uncommon in the Delph (A. T.); Nottingham district, not uncommon (W. E. R.).

Anchomenus micans Nic. Nottingham, not uncommon (W. E. R.).

Anchomenus fuliginosus Panz. Retford (S. P.); Nottingham, common (W. E. R.).

Anchomenus piceus L. Beeston (W. E. R.).

Anchomenus puellus Dej. Colwick (W. E. R.); not uncommon in early spring by Trent side, Nottingham (W. E. R.).

Olisthopus rotundatus Payk. South Leverton, once only (A. T.); Nottingham (W. E. R.).

Bembidium rufescens Guév. Treswell, 8th October 1898, under bark of pines (A. T.); Cottam (S. P.); Nottingham (W. E. R.).

Bembidium quinquestriatum Gyll. South Leverton, once only (A. T.).

Bembidium obtusum Sturm. South Leverton, common (A. T.); Nottingham, not common (W. E. R.).

Bembidium guttula F. Retford district, common (A. T.); Nottingham district, common (W. E. R.).

Bembidium mannerheimi Sahl. Common in early spring by the Trent in flood refuse, Nottingham (W. E. R.).

Bembidium biguttatum F. Rampton, Littleborough (A. T.); Nottingham district, not common (W. E. R.).

Bembidium riparium Ol. Nottingham (W. E. R.).

Bembidium æneum Germ. Cottam, bank of Trent, common (A. T.); Nottingham, not uncommon (W. E. R.).

Bembidium doris Panz. 'Newark, in plenty,' J. F. Dawson, in Ent. Ann., 1856, pp. 65-81. But it is strange that nothing has since been heard of this well-marked species (A. T.).

Bembidium gilvipes Sturm. South Leverton (A. T.); Cottam (A. T.); Rampton (A. T.); Nottingham district, common (W. E. R.).

Bembidium lampros Herbst. Retford district, common (A. T.); Nottingham district (W. E. R.). [I have no records of the variety *velox* (Erichson) for the county. A. T.]

Bembidium tibiale Duft. Thurgarton (W. E. R.).

Bembidium decorum Panz. South Leverton (A. T.); Burton Joyce; Radcliffe-on-Trent (W. E. R.).

Bembidium nitidulum Marsh. Grove (S. P.); Thurgarton (W. E. R.); Cottam (A. T.).

Bembidium stomoides Dej. In 1896 I found this rare species in profusion on the Lincolnshire side of the Trent. I next found it not uncommonly on the Nottinghamshire side at Cottam and Rampton; and Mr. Pegler has found it at Littleborough and West Burton. It is best found at the roots of long grass (*Alopecurus* sp.) close to the water's edge; and is easily confused with the common *B. littorale* when running fast (A. T.).

Bembidium quadriguttatum F. Retford (S. P.); Nottingham; Beeston (W. E. R.); Clifton Grove (Freestone).

Bembidium quadrimaculatum Gyll. South Leverton; Walkeringham (A. T.); Nottingham (W. E. R.).

Bembidium lunatum Duft. This fine species is not uncommon in the same localities where *B. stomoides* occurs; especially at Cottam (A. T.).

Bembidium femoratum Sturm. Rampton, common on the river bank (A. T.); Clumber (S. P.); West Burton (S. P.); Nottingham, common (W. E. R.).

Bembidium littorale Ol. Retford district, common (A. T.); Nottingham district, common (W. E. R.).

Bembidium fluviatile Dej. Crow Park (S. P.); Colwick (Wallis); Nottingham (W. E. R.); Newark (Fowler, Brit. Coleop. I., p. 117).

Bembidium punctulatum Drap. Barton-in-Fabis, Beeston, Colwick (W. E. R.).

Bembidium flammulatum Clairv. Nottingham, not uncommon (W. E. R.); West Burton (S. P.).

Tachypus flavipes L. Cottam (A. T.); Littleborough (S. P.); Nottingham (W. E. R. and others).

Trechus discus F. Banks of Trent at Newark (Fowler, Brit. Coleop. I., p. 126); Nottingham (Pope); opp. Gainsborough (S. P.).

Trechus micros Herbst. Retford; Cottam (S. P.).

Trechus minutus F. Retford district, common (A. T.); Nottingham district, common (W. E. R.).

VAR. ***obtusus*** Er. Beeston (W. E. R.).

Trechus secalis Payk. Nottingham (W. E. R.).

Patrobus excavatus Payk. South Leverton, casually (A. T.); Nottingham district (W. E. R.).

Demetrias atricapillus L. South Leverton, not uncommon in late summer (A. T.); Nottingham district, not uncommon (W. E. R.).

Dromius linearis Ol. South Leverton, common (A. T.); Nottingham district, common (W. E. R.).

Dromius agilis F. Nottingham; seems to be commoner in Nottingham district than *D. meridionalis* (W. E. R.).

Dromius meridionalis Dej. South Leverton (A. T.); Retford (S. P.); Nottingham (W. E. R.).

Dromius quadrimaculatus L. South Leverton; Treswell (A.T.); Nottingham district, not uncommon (W. E. R.).

Dromius quadrinotatus Panz. South Leverton, not uncommon (A. T.); Nottingham (W. E. R.).

Dromius melanocephalus Dej. Sutton Gravel Pit, near Retford (A. T.); Nottingham district (W. E. R.).

Metabletus foveola Gyll. Clumber (S. P.); Sherwood Forest (W. E. R.); Bramcote, near Nottingham (W. E. R.).

Metabletus truncatellus L. Bramcote, near Nottingham, one example (W. E. R.).

NOTES on CHESHIRE BIRDS.

Shag in Cheshire.—Mr. C. R. T. Congreve's note (Nat., March 1901, p. 75) on the Shag (*Phalacrocorax graculus*) in Cheshire is exceedingly interesting. Cormorants (*P. carbo*) sometimes visit the estuaries of the Dee and Mersey, and have also been met with inland, but no evidence has been forthcoming concerning the Shag until quite recently, and Mr. Congreve's is the first recorded. One, however, visited the mere at Great Budworth, near Northwich, in the winter of 1898-99, and was watched on several occasions by Miss Hargrave, of Great Budworth. It used to spend a good deal of its time on a spit of sand at the mouth of a small brook, and gave Miss Hargrave many opportunities of examining it with her glass. In the following winter, 1899-1900, she several times watched a Cormorant which frequented the mere for some time.—T. A. COWARD, Bowdon, Cheshire, 6th March 1901.

Ducks on the Cheshire Meres.—The Rev. E. Adrian Woodruffe-Peacock's note (Naturalist, March 1901, p. 74) is, through no fault of his, a little misleading. The Tufted Duck (*Fuligula fuligula*) is a regular winter visitor to the Cheshire meres, and there is strong presumptive evidence that it occasionally remains to breed. This winter there have been an unusually large number of ducks on all the Cheshire waters; Pochards (*F. ferina*) and Tufted Ducks being especially abundant. Since October Mr. C. Oldham and I have seen flocks of Pochards and Tufted Ducks in varying numbers on Redes Mere, Rostherne, Alderley Mere, Mere Mere, Booths' Mere, and Budworth Mere (Marbury, near Northwich). The flocks were largest on Rostherne and Budworth. There were perhaps more Tufted Ducks on Rostherne Mere than on the other waters, and although their white sides showed up very distinctly from a great distance, it was impossible to count them amongst the hundreds of Pochards. On Budworth, where the drake mentioned was killed, the Pochards sometimes numbered two to three hundred birds, and there were on several days during January small flocks of over a dozen Tufted Ducks. Mr. J. Hindley, who shot the bird recorded, was with me on several occasions, and we used his telescope to examine the flocks; so that he was well aware of the numbers of the birds. Of late years we have generally seen a few Pochards and Tufted Ducks on all the larger sheets of water, but this winter their numbers have been exceptionally large. The flocks of Mallard (*Anas boschas*) were also larger than is generally the case.

At Budworth, on 9th January 1901, I saw a couple of ducks that kept a little apart from the others, and I felt almost sure that one of them was a Scaup (*Fuligula marila*). On the 16th I again visited the water, and fortunately managed to get close to this bird, which was feeding with about half a dozen Tufted Ducks close in shore, and the black head and neck and vermiculated back showed undoubtedly that it was a drake Scaup. At a distance the deep chocolate heads of old Pochard drakes look very dark, but when seen so close as a few yards there is no mistaking the colour.

A pair of Shovelers (*Spatula clypeata*) frequented Tabley Mere for some weeks early in the year, and the drake was shot on 13th February, and is now in the Grosvenor Museum, Chester.—T. A. COWARD, Bowdon, Cheshire, 6th March 1901.

YORKSHIRE COAST EROSION COMMITTEE.

REPORT FOR 1899 AND 1900.*

THOMAS SHEPPARD, F.G.S.,

Secretary of the Committee; Curator of the Municipal Museum, Hull.

In view of the remarks made at the Annual Meeting of the Yorkshire Naturalists' Union, held at Scarborough in 1898, as to the work of the Committees of the Union generally, an effort has been made during the past two years to undertake a systematic survey of the coast from the Humber to the Tees, and thus justify the existence of the Coast Erosion Committee! This work, however, cannot be accomplished in one year, and particulars of the measurements, etc., thus far obtained, are consequently held over, and will be published, together with other details, in a subsequent report. Once having obtained a series of measurements at frequent and fairly regular intervals along the coast, on the lines of those given by the Rev. E. M. Cole, M.A., in the 'Naturalist' for April 1892 (pp. 103-107), and May 1893 (pp. 142-144), arrangements will be made for them to be checked periodically, and the results printed in this journal. Mr. H. B. Muff, F.G.S., has supplied us with some measurements in the Whitby neighbourhood; Mr. T. Petch, B.A., B.Sc., has measured some distances near Aldborough; and the late Canon Maddock, M.A., and Mr. J. W. Stather, F.G.S., have visited South Holderness on the work of the Committee. Whilst arrangements are being made for other parts of the coast to be examined shortly, the Committee would be glad to receive particulars of measurements from easily recognisable points to the cliff edge at any other station along the coast. Prof. John Phillips, in his 'Rivers, Mountains, and Sea-coast of Yorkshire' (1855, pp. 282-383), gives a valuable table of 'Distances from . . . objects to the nearest descents in the Cliff,' between Bridlington and Spurn—nearly fifty localities in all. It is very desirable that these distances should be again measured, and the Committee, which is at present engaged in this work, would be glad for any help in this direction. More records for the northern part of the coast are also needed.

* For previous reports see the 'Naturalist,' April 1892, pp. 103-107, and May 1893, pp. 142-144.

1901 April 1.

It has been stated that the erosion of the cliffs in the vicinity of Spurn Point has assumed a serious aspect, and large tracts of land are liable to be flooded. The Humber Commissioners and others, however, have officially visited the district, and we believe some steps have been taken to protect the coast at this point. A careful watch is being kept by the coastguards and others.

Early in 1899 there was an extensive fall of cliff at Filey, a short distance north of the ravine, and several thousand tons of Boulder clay were displaced. The greater portion of this, however, has already been removed by the waves. Mr. Stather has secured photographs of the cliffs soon after the fall.* Landslips of a somewhat serious nature have also occurred at Scarborough and Robin Hood's Bay during the last two years.

It perhaps should here be recorded that, in August 1898, Mr. Tom Pygas, of Withernsea, was brought before the Hull Police Court for removing sand and shingle from the beach at Withernsea. The material removed had accumulated on a bank and in a field above high-water mark, and although for years a high rental had been paid for the field on account of the sand to be collected from it, the defendant lost his case, and had to pay a fine of £1 and costs (over £20).† We notice, however, that gravel and sand in large quantities is regularly being abstracted from the beach at Atwick, Skipsea, and other places on the Holderness coast, without let or hindrance.

At Withernsea the inroads of the sea have had such an effect upon the cliffs that the groynes formerly erected to retain the beach are becoming useless, partly on account of their ever-increasing distance from the cliffs, and partly for want of repair. After a strong on-shore gale it is now no uncommon thing to see the beach entirely divested of sand and shingle.

In May 1899, on the occasion of the visit of the Yorkshire Naturalists' Union to Hornsea and Skipsea, an excellent opportunity of examining the condition of the Holderness cliffs was afforded, and of this advantage was taken by most of the members of the Committee and others. The manner in which the land is disappearing in this part of the coast was most obvious.

In January 1900 various Holderness land-owners met at Hull to consider what steps should be taken to check the inroads of

* These were exhibited when this report was presented.

† See 'Eastern Morning News,' 24th August 1898.

the sea, and various schemes were submitted and discussed.‡ So far as we have been able to learn, however, no practical result seems to have accrued up to the present.

In previous years this Committee has taken measurements of the distance between the cliff edge and Sands Cottage, which is situated just north of the promenade at Old Bridlington. A year or two ago this cottage was quite close to the cliffs. The promenade, however, has now been extended beyond the cottage, and a road has been made and a sea-wall erected in front of it. The actual distance of the cottage from the edge of the sea-wall is therefore now much greater than it was from the cliff edge a short time ago. This should be borne in mind in calculating future measurements at this point.

From the various articles and letters which have appeared in different local papers recently, some of which are interesting, some accurate, and some neither, the Committee has every confidence that the ultimate result of its work will be of some permanent value.

The Committee record, with regret, the death of their member, the late Rev. Canon Maddock, M.A., of Patrington. Mr. Maddock had been a member of the Committee since its formation in 1888, and devoted some attention to the erosion of the Holderness cliffs.

The following is the present Committee:—Chairman, Rev. E. M. Cole, M.A., The Vicarage, Wetwang; Secretary, Thos. Sheppard, F.G.S., The Museum, Hull; J. W. Stather, F.G.S., Hull; F. F. Walton, F.G.S., Hull; and W. Y. Veitch, M.R.C.S., Middlesbrough.

P.S.—25th March 1901.—In view of the recent articles which have appeared in the Hull papers in reference to the alleged 'alarming' state of affairs in south Holderness, during the present month (March) the writer has visited the district, and carefully examined the cliffs, especially in the vicinity of Kilnsea Lane end, where it is stated the great danger lies. There was abundant evidence everywhere of the great destruction being carried on by the sea. Large strips of land, in some instances several yards across, had become detached and partly slipped down the cliffs. Several falls of clay, obviously recent, were noticed. One or two small falls were actually seen to take place. Undoubtedly, as will be seen when the measurements

‡ See 'Eastern Morning News,' 1st February 1900.

taken are published, the cliffs are here being denuded at a rapid rate. But I could find no signs whatever of any immediate danger of the sea breaking through and altering the channel of the Humber! In one or two places where the cliffs are unusually low—generally on the sites of ancient meres—the higher ground on each side has been connected by an embankment. Towards Spurn Point ample protection is afforded by very good groynes, which stay the progress of the southwardly travelling shingle, and thus protect the land from the force of the waves.

NOTES on FUNGI.

Fungi in Yorkshire and Derbyshire.—The following finds, made at various times and in widely different localities, deserve notice:—

Geopyxis coccinea Mass.—Mr. H. Staniforth exhibited some fine specimens of this most beautiful Discomycete at the annual conversazione of the Sheffield Naturalists' Club, held on 22nd February last. They were gathered in a wood near Kiveton Park, Yorkshire, and are locally called 'Morell Cups.' They will keep fresh for a considerable time in damp moss, the specimens exhibited having originally been gathered before the 25th January, the date originally fixed for the function, which, like many others, was postponed on account of the recent melancholy national event. Mr. Staniforth made a similar exhibit at last year's conversazione.

Boletus parasiticus Bull.—I found this species in August 1899 in Brierley Wood, near Sheepbridge, Derbyshire. It was growing upon its usual host, *Scleroderma vulgare* Fr.

Cantharellus lobatus Fr.—I have a specimen of this curious little species found at Carlton-in-Cleveland at the Yorkshire Naturalists' Union meeting in August 1899. It was growing upon *Hypnum*. I believe Mr. W. West, F.L.S., was the finder.—Thos. Gibbs, 43, St. Ronan's Road, Sheffield, 5th March 1901.

Fungi near Wirksworth, Derbyshire.—In the following note I put on record the mycological results of an hour's ramble through a plantation close to Wirksworth, Derbyshire, late in October last year. Larch and Scotch Fir are the chief components of the plantation in question, and the soil consists almost entirely of fir needles and other leaf mould. Among this, saturated as it was with the morning dew, the smaller *Mycenas* luxuriated, the milky-juiced *M. galopoda* Schrad. being especially abundant. *Collybia butyracea* Bull. and *Clitocybe brumalis* Fr. both swarmed and showed a tendency to grow in rings, which I have not seen noticed in connection with these two species. Upon stumps *Hypholoma capnoides* Fr. was as abundant as its congener the bitter tasting *H. fascicularis* Huds. Three of the smaller *Lepiotas* occurred, *L. amianthina* Scop. in abundance throughout the wood, while the grass rides produced more sparingly *L. carcharias* Pers. and a pretty white form of *L. granulosa* Batsch. These grass rides also produced several specimens of *Tricholoma imbricatum* Fr., while the handsome *T. rutilans* Schæff. occurred in the denser parts of the wood. *Cantharellus aurantiacus* Fr. also occurred in the wood, while among the grass on its outskirts and in the adjoining fields were *Amanitopsis vaginata* Roze, *Hygrophorus hypothejus* Fr., *H. lætus* Fr., and the beautiful *Russula drimeia* Cke. My attention was practically confined to the Agaricini, but I found a specimen of *Cordyceps militaris* Fr. growing from a Lepidopterous pupa.—Thos. Gibbs, 43, St. Ronan's Road, Sheffield, 5th March 1901.

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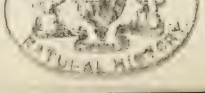

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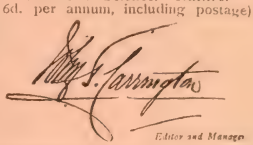

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GEOLOGY OF THE NEIGHBOURHOOD OF BROUGH, EAST YORKSHIRE.

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The village of Brough is pleasantly situated on the northern bank of the Humber, about ten miles west of Hull. To the north and east it is surrounded and sheltered by the Chalk Wolds, whilst to the west, after passing the alluvial flats at Broomfleet, the peat bogs of Goole and Thorne Moors occur, and further on the barren Triassic sandstones of the Vale of York.

There are no rocks older than the lias in the Brough neighbourhood; these beds crop out a few miles to the north-west. Of course a few pebbles and boulders of palæozoic rocks occur in the gravels, but these have been brought into their present situations in comparatively recent times.

The rocks at Brough all belong to the secondaries, and are capped by gravels of post-tertiary age. The various strata are very fossiliferous, and what is more, the fossils can be readily extracted.

Probably the best way to deal in this paper with the rocks is to describe them in their natural order, commencing with the lowest. The Lias, as I have already hinted, crops out to the north-west, but rather out of the district I had intended to describe in these notes, so I propose to only briefly refer to this rock. From North Cave towards Cliff there is an escarpment overlooking the southern extremity of the Plain of York, which is composed of the lowest strata of the Lower Lias. Two or three good exposures occur which enable the beds to be fairly well examined. Going northwards from North Cave the first section is in a field and has been made for marling the land below. Here fossils are abundant, and the pit is of some importance from a geological point of view, as it contains lower beds in the lias than can be met with in the Yorkshire coast sections. *Ammonites johnstoni*, *Lima gigantea*, and *Cardinia listeri* are fairly plentiful, and whole beds of a small *Ostrea* can be met with in the lower portion of the pit. More rarely *Nautilus striatus*, *Modiola minima*, and *Pleuromya crowcombeia* can be found. Of most interest, however, is *Ammonites*

planorbis. This of course indicates the presence of the very lowest beds of the Lias, and the Rhætics should not be far away; in fact, a section in the floor of the pit might reasonably be expected to reveal the characteristic tea-green shales of that series. I have occasionally had a dig down, but apparently have not gone deep enough, as I have found no trace of them. The appearance of this first section is very striking. It is made in the steep slope of the escarpment, and the thin beds of hard

Contortions in the Lower Lias at Shepherd's Well, near North Cave.

blue fossiliferous limestone stand boldly out from the intervening soft shales. In these latter are large quantities of crystals of selenite.

Banked up against the escarpment are some blown sands which have been derived from the Trias of the Vale of York. Rabbits and moles burrow freely into this material, and in a pile of earth thrown up by one of the latter I recently found a flint implement; this being a district in which I had not previously met with them.

A little to the north is a similar though smaller section, also in a field a short distance from the road. Though fossils are

not so plentiful here the pit is of interest, as the beds have been contorted and crumpled in a remarkable manner; resembling two or three W's. A depression on the top of the hill, just above the pit, seems to suggest a fault or slight displacement, though at first glance the crumplings are very suggestive of glacial action. A stream of water issues from the shales near the entrance to this pit—the rusty appearance of the rocks adjacent betraying its chalybeate properties. But in addition to the superabundance of iron in the water there is apparently an excess of lime, as large slabs of petrified moss, reeds, etc., can be picked up in the bottom of the stream. In one place where the water flows over a slight ridge huge masses of calcareous tufa occur, in steps one above another. These readily come to pieces under the blows of the hammer and reveal an enormous thickness of encrusted moss.

Further northward still and we reach the sections described by Messrs. Tate and Blake in their work on 'The Yorkshire Lias,' 1876, pp. 38-39. These occur on the sides of a road which crosses the hill, and fossils are fairly plentiful. Amongst them are some peculiar deformed *Ostrea*, which on their outer surface have the impression of an ammonite. These, Mr. P. F. Kendall suggests, evidently represent the upper valves of the *Ostrea*, the lower valves of which have adhered to the shells, probably cast shells, of *Ammonites planorbis*. So far, however, though plenty of loose valves have been obtained, in not a single case has an ammonite been secured with the valve of an *Ostrea* attached.

The Middle Lias does occur in the neighbourhood, but that is about all that can be said of it. No good sections are now visible, though some small ones were opened out during the construction of the Hull and Barnsley Railway in the early Eighties—the beds of the *Ammonites capricornus* and *Ammonites spinatus* zones being traced. Slabs of this rock are visible on the slopes on the line side between North and South Cave.

The Upper Lias is even still worse as regards sections; in fact, I know of no exposure worthy of the name. The beds are very thin here, only a very narrow band being mapped, and this I believe on the evidence of sections on drain sides, in well-shafts, etc.

We now reach the Oolites. These form by far the most important feature of the district, and no one can speak on this subject without referring to Mr. Alfred Harker's short but pithy paper on the 'Oolites of the Cave District,' which appeared in the 'Naturalist' for May 1885, pp. 229-232.

The Oolites represented are the Estuarine Series, the Millepore Limestone, and the Great Oolite Clay, of the Lower Oolites; and the Kellaways Rock, Oxford Clay and Kimmeridge Clay of the Middle and Upper Oolites.

Let us deal with the Estuarine series first. These beds occur but sparingly, the best sections being in a beck above Elloughton Mill. These show 'hydraulic limestone 2 ft. 6 in.; yellow sandy clay, 6 ft.; and calcareous sandstone with fossils, 3 in. Another exposure showing 3 ft. of limestone is on the road leading to the mill east of Hotham.'* Mr. Fox-Strangways states† that 'these beds which form the base of the Lower Oolites of the district, are the same as those to which the name 'Basement Beds' has been given in Lincolnshire, with which they should be correlated in preference to the Lower Estuarine series of the Yorkshire coast.' Unfortunately the remains of plants so characteristic of the latter beds do not occur at Brough.

Next in order comes the Millepore or Cave Oolite. Here certainly we have a more satisfactory deposit to deal with. It occurs in thick beds varying from 20 to 30 feet in depth. The Millepore Oolite is so called from the presence therein of a small branching coral, *Cricopora straminea*. This fossil appears to be much more plentiful in the lower beds of the Millepore, which are exposed at the western end of the outcrop near South Cave Station. The Millepore limestone is a particularly good example of the 'roe-stone,' and usually shows this structure remarkably well. Exposures of the rock, as might be anticipated, are numerous. Some have been made for lime, others for building material, and still others have been made whilst constructing railways, etc. It rarely happens that this rock is suitable for building purposes, though I believe it has been tried, and it was extensively used in connection with the erection of Beverley Minster. The current-bedding, which is so strongly marked in this series, is a disadvantage from a builder's point of view. Some of the walls in the district have been built of the rock, for example, that in front of Cave Castle, but they do not last long, and it is no uncommon thing to see the mortar standing out from the wall, the intervening limestone having weathered and crumbled away. But geologists must not grumble at this, as these weathered walls are excellent collecting grounds for fossils!

* Geol. Surv. Mem., 'Country between York and Hull,' 1886, p. 20.

† loc. cit. p. 19.

There is a very good section on the line side a few hundred yards west of South Cave railway station, which may be regarded as a typical one. The rock is strongly current-bedded —a huge mass two feet in depth suddenly tapers off, and within a short distance from its thickest part it is reduced to a few inches in depth. The limestone is usually of a crumbly nature, though, as already stated, fairly solid masses are to be met with. When weathered the Millepore is of a light yellow colour, and in places of a sandy texture; but on breaking open some of the larger lumps they are found to be blue-hearted, and these unweathered portions are very tough and the fossils are with difficulty extracted. At this railway section various fossils can be collected, but with greater ease and success in the small gullies down which the weathered material has been washed, as in these gullies a process of natural selection has taken place, to the great advantage of the collector. *Terebratulæ*, *Lima*, *Pecten*, *Pinna*, and remains of Echinoderms are common, and now and then a *Turbo* or other univalve can be picked up.

Good sections in the Millepore also occur in a field between South Cave and Hotham. The beds here are alternately of sandstone and limestone; the latter having a peculiar nodular appearance. Fossils are numerous, pretty little echinoderms being amongst the best from a collector's standpoint. Amongst univalves should be mentioned *Chemnitzia*, *Cerithium*, and *Turbo*; whilst bivalves are represented by *Avicula*, *Rhynchonella*, *Terebratula*, *Modiola*, *Trigonia*, *Lima*, etc. *Pentacrinus*, *Serpula*, and a host of other interesting remains are also to be obtained.* There are remains of very extensive excavations here; and it is said that from this place the stone for parts of Beverley Minster was obtained.

In the 'Cockle Pits,' near Brough, some good solid beds of Millepore Limestone are exposed. These were formerly extensively quarried for material required in connection with the construction of one of the Hull docks; but whilst quarrying operations were going on water was struck and rushed in upon the workmen, who with difficulty escaped. The barrows and tools, or what is left of them, still lie at the bottom of the pond which occupies the centre of the excavation.

An interesting exposure in the Millepore Oolite has recently been made in the northern end of Prescott's Pit. Below the gravel a deep cut has been dug which shows in a remarkably

* See Trans. Hull Geol. Soc., Vol. 2, 1894-5, pp. 9-10.

clear manner the gradual change from the solid rock into the gravel and finally into the soil.

At the bottom of Mill Hill, which is nearer Brough, there is a very small but interesting exposure which is exceedingly fossiliferous, and Mr. Harker thinks it belongs to the lowest beds of the Millepore. This small section, which was but a few feet square when I first saw it, is exceedingly rich in organic remains. The minute spiny *Rhynchonella crossi*, and *Terebratula* sp. ?, usually crushed in a curious manner (for secondary fossils) are the most abundant. *Pinna cuneata, Pecten lens,* and *P. demissus, Myacites, Cardium, Lima,* etc., also occur. Mr. Harker records a fine *Hybodus* tooth, a find it was never my lot to make, though a year or two ago, on an excursion of the Yorkshire Naturalists' Union in the neighbourhood, one of the members picked up a small black palate tooth on a piece of Millepore from a heap of repairing metal at the roadside.

The fossiliferous section just referred to will soon be out of the reach of geologists, as a villa is being erected on its site; another example of the drawbacks of 'civilisation' from a geologist's point of view.

Our next rock is rather a disappointing one, and is known by the name of the Great Oolite Clay or Sandy Oolite. It consists of a series of sands and clays. They were 'first considered to be the equivalent of the Upper Estuarine Series of the Yorkshire coast, but as they join on with the Great Oolite Clays of Lincolnshire they have now been mapped with that formation.* No fossils are recorded from this, and there are no exposures, such particulars as are recorded being the result of borings for wells, etc. A few years ago I put on record† details of the beds exposed in a well then being dug about half-way up Mill Hill, near Brough. The strata cut through, commencing at the top, were stiff blue clay stained with yellow at different points, and containing neither fossils nor stones; then yellow clay, and, finally, fine yellow sand.

When the Survey Memoir on this district was written in 1886 the only exposure in the Great Oolite Clay then visible was on the railway embankment near South Cave station; but of this section the surveyor says:—'The beds are so similar to the sands of the Kellaways Rocks above that it is difficult to fix an exact horizon between them.'‡ It has since been well grassed

* Geol. Survey Mem., op. cit., p. 22.

† Proc. Yorks. Geol. and Polyt. Soc., 1896, p. 222.

‡ p. 22.

over, and for the word 'difficult' we must now substitute 'impossible.'

We next have the Kellaways series, viz., soft sands and a hard sandstone; this latter being *the* rock in this district for fossils.

The Kellaways Sands, forming the base of the series, come first. They are well exposed in the parish sand-pit at Newbald, and a peculiar *Modiola* there occurs in a certain bed, which I have not been successful in finding elsewhere in the district, though I have met with it on the coast near Scarborough. Near Sancton Church other beds are exposed, but apparently at a different horizon, as they consist of pure white, soft, 'flaggy' sandstone, with a large quantity of small flakes of light-coloured mica. In the South Cave railway cutting, immediately underlying the hard Kellaways Rock, similar beds can also be partially examined, thanks to the efforts of the rabbits which burrow to a great extent in these sands. In two or three places the characteristic doggers stand out, Sphinx-like, from the gentle slope of the soft sandstone. These doggers contain fossils, chiefly *Belemnites* and *Gryphæa*, but being spherical, and exceedingly hard and tough, it is with difficulty that they can be broken. A good clean section was exposed about five years ago whilst erecting a tank on the railway embankment. White sands, with ferruginous stains, were then visible.

Another section in these sands should be mentioned. I first saw it on paying a visit to Brough early last summer. It was in a field on the side of the road leading to the summit of Mill Hill. It was a good distance up the hill, being only some 20 or 30 feet from the top, which is 100 feet above Ordnance Datum.

The excavation is made in soft white sand, which is occasionally ferruginous, and beds of hard sandstone, varying in thickness from one to three inches, traverse it in the upper part of the section. These beds of sandstone are practically horizontal, and contain casts of *Belemnites owenii*, *Gryphæa bilobata*, *Trigonia*, and other characteristic Kellaways Rock fossils. In hardly a single instance was a portion of a shell remaining, the whole of the lime having been dissolved away. There is only a thin covering of soil, and this contains numerous pebbles of doubtful origin, and a quantity of broken Roman pottery. The excavated material is sent to Leeds, where it is used by an engineering firm for making moulds for castings.

On my first visit to the pit I obtained a piece of material which appeared to be entirely composed of oxide of iron; it was of rather peculiar shape and seemed to be a concretion such

as is occasionally met with in the Kellaways Rock. On picking up further pieces, however, it became evident that they were small fragments of bone. Subsequent visits were the means of finding still more specimens, chiefly whole and broken vertebræ, pieces of ribs, etc. On one of these occasions I was fortunate enough to find a vertebra protruding from the quarry face, at a depth of about seven feet; this was in close proximity to the heap from which the other remains had been collected. With the assistance of a pick this bone was extracted, and, as might be expected, several others were found, on the same level, fitting close together. These vertebræ were nearly circular and without the prominent processes which occurred on some of the earlier specimens found on the refuse heap. Evidently, therefore, we had got to the tail end of the animal, and unfortunately the most important remains had already been excavated and were not preserved. However, the find in the quarry face enabled the exact position of the animal in the rock to be fixed, and there can be little doubt that the almost complete skeleton of a huge saurian had been buried in the quarry, where it had rested undisturbed from the day it was deposited during Jurassic times. Some large paddle bones were obtained by Mr. W. Richardson, and these Mr. Richardson has been good enough to hand over to me.

The specimens were forwarded to Mr. E. T. Newton, F.R.S., Palæontologist to the Geological Survey, who has kindly examined them for me. He reports that they 'belong to some animal allied to the *Plesiosaurus,* and probably to the one which has been named *Cryptocleidus,* but the broken condition of the specimens prevents a certain determination.' Mr. Newton adds, 'such reptiles are known from the Oxford Clay, but not from the Kellaways Rock,' and I have a letter from Mr. C. Fox-Strangways, author of the 'Jurassic Rocks of Yorkshire,' to the same effect.

The fossils have been determined as follows:—Parts of paddle-bones, femur or humerus; paddle ossicles; piece of jaw; portions of vertebræ; and ribs. The portion of the jaw is very interesting, but unfortunately is only the anterior half of the lower jaw, and does not contain any teeth. In addition to the above, which represent the specimens sent to London, there are dozens of pieces of bone, though principally vertebræ and ribs. Reference to a restoration of a *Plesiosaurus* in any of the geological text books will make the reason for the abundance of pieces of ribs and vertebræ obvious enough.

The condition of the remains is interesting. Being found in a soft, sandy deposit they were easily extracted, and a chisel was not required. There has been little difficulty, therefore, in freeing the bones from the matrix, an operation which would have been exceedingly difficult had they been found in the hard rock. The bones as already stated are very ferruginous, and some of them almost have the appearance of cast iron. It is doubtless owing to this fact that the specimens are in such a good state of preservation.

Section in the Kellaways Rock, near South Cave Railway Station.

These relics of *Cryptocleidus* give that animal a much earlier and longer period of sojourn upon this earth than previous records from the Oxford Clay have warranted.

Just below the remains the sand is much whiter and finer, and more resembles the section of pure white sand near Sancton Church, already described.

We now have to deal with the Kellaways Rock. Certainly the best exposure occurs in the railway embankments on each side of the line east of South Cave station. Other sections occur, one on the road-side a little north of that station;

another towards South Cave village, and I have a suspicion that very small detached remnants lie in places on the top of Mill Hill, as I have met with huge slabs of the rock in the floor of the gravel pit on its summit. But these latter examples are of little importance compared with the solid bed which stands boldly from the railway cutting, with a perpendicular face eight feet in depth, and dipping towards the east at an angle of about 5°. It is a very rough ferruginous sandstone, usually rather hard, but occasionally, where the particles are apparently held together by a strong cement of lime, it is much tougher. The oolitic structure is exhibited in such patches. The bottom layer, i.e., next to the Kellaways Sands, from six to 10 inches in thickness, is a veritable oyster bed, being one mass of very fine examples of *Ostrea bilobata*, usually with both valves in juxtaposition. This extends throughout the whole length of the section. Casts of a great variety of bivalves are also to be found here, and this bottom bed is the usual collecting place for beginners, as the fossils appear to be the most plentiful and can be readily extracted; but they are only casts. Towards the top of the section *Belemnites owenii* is very plentiful, and very large specimens can be collected, though it requires a fair amount of patience to extract them whole, as they so readily break in sections. Scattered here and there throughout the rock are numerous fossils of different descriptions. Now and then a mass, consisting of hundreds of specimens of the pretty *Rhynchonella socialis*, is met with, and a little further on a similar nest of a small bivalve, *Isocardia minima*. These occur in light-coloured calcareous patches, varying in diameter from three or four inches to a foot, and are exceedingly tough, and the fossils are difficult to extract; but it is in these hard patches that the various species of beautiful Ammonites for which the Kellaways Rock is so noted are to be found. A good sledge hammer is as serviceable as anything for the work (for *work* it is), and one of these nests is rarely broken without two or three fine *Ammonites calloviensis* or *A. kœnigi* being disclosed.

Just on the ledge forming the top of the bed of Kellaways Rock in this cutting are thousands of broken *Belemnites*, which seem to have been accumulated and buried at the bottom of the Oolitic sea; several of these have a phosphatised appearance. They are *Belemnites owenii*, and invariably broken—a whole one rarely occurs; but the accumulation is so remarkable that it is worth recording. On this horizon, too, are large masses of gypsum in the crystalline form.

Further details of this bed can be found in a paper on 'Sections at Cave, Yorkshire,' by Messrs. Keeping and Middlemiss, printed in the 'Geological Magazine' for 1883; in the Survey Memoir on the district ('The Geology of the Country between York and Hull,' 1886), or in the Rev. E. M. Cole's 'Geology of the Hull and Barnsley Railway,' 1886.

Next in succession comes the Oxford Clay. When the Hull and Barnsley Railway was constructed a bed of this, 15 feet in thickness, was met with in the cutting immediately above the Kelloway Rock, though it was almost wholly covered by surface deposits; and at the present day it is so grassed over as to be difficult to examine at all. I have collected the typical Oxford Clay *Belemnites* here, just above the ledge of Kellaways Rock, and, in addition to these, Messrs. Keeping and Middlemiss, in their paper already referred to, record *Gryphæa dilatata*, a paddle bone of *Plesiosaurus*, and fossil wood. I know of no other undoubted exposure of Oxford Clay in the neighbourhood.

A little further east the line cuts through a thin bed of dark clay which has been referred to Kimmeridge Clay, but there seems to be some doubt about this. It has been suggested that a representative of the Speeton Clay occurs here; it is quite possible that the equivalents of both are represented, but the unsatisfactory condition of the exposure makes this a moot point at present. I have seen some small *Belemnites* from the section, however, which greatly resemble Kimmeridge Clay species.

I have now briefly described the local Jurassic rocks, from the Lower Lias upwards. So far each rock has appeared, lying comformably on its predecessor, each and all dipping towards the east at a low angle. The Hull and Barnsley Railway, running east and west, has cut through them, successively, practically at right angles to the strike, thus affording an exceptional opportunity of seeing them in their natural order. But now that we have reached the Kimmeridge there is most conclusive evidence of a change in the usual course of events having taken place. The regular deposition of the various strata we have reviewed is clear evidence of the rocks having been deposited, without serious interruption, one after another, though at different depths and under different circumstances. Still there is no great break—no pronounced unconformity. Before the chalk was deposited, however, the rocks were upheaved, denuded, and levelled off. They then sank again, after which first the Red Chalk and then the White Chalk were

gradually deposited, *on the upturned edges* of the previous formations. We thus find that the chalk in this neighbourhood rests directly on the Kimmeridge Clay, and further on, on the Kellaways Rock, then on the Millepore Limestone, and finally directly on the Lias. Unfortunately there are no sections clearly showing the junction of the chalk and one of the other rocks enumerated, but the direction of the underlying beds, and the evidence afforded by borings, favour this view. Messrs. Tate and Blake, in their work already referred to, record a section in a brick-pit near Warter, in which the Red Chalk rests directly on the Lower Lias. See also Trans. Leeds Geol. Assn., Part 9, 1893-4, p. 98 ('Excursion to Pocklington with the Yorkshire Naturalists' Union').

At the base of the Cretaceous system, omitting for the present the very doubtful occurrence of the Speeton Clay, the Red Chalk is found. Near Weedley Springs, east of South Cave Station, beds of this occur and amongst it are numbers of bright phosphatic nodules, with oolitic granules adhering thereto, which forcibly call to mind the Carstone of Lincolnshire; and it is probable that in this cutting (as also in a small section near Acklam Brow) the Carstone is represented. Small quartzite pebbles, well polished, can also be obtained from the material. Among the fossils are *Belemnites minimus, Terebratula biplicata, Serpulæ,* etc. Of course, the Red Chalk is found throughout the chalk district; it can be traced in the dales in many places—lines of springs betraying its presence. At Welton, a few years ago, when some excavations were made near the springs, excellent sections in the Red Chalk (which was a good thickness at this point) were visible.

Next above comes the Lower Chalk, with its 'pink bands.' This is the best of the chalk beds from the collector's point of view. Sections can be seen in two or three places, but perhaps at best advantage in the railway cutting. The 'black band,' or *Belemnitella plena* zone, which separates the Middle from the Lower Chalk, can also be traced, the dark shales contrasting well with the white chalk above and below. So far its characteristic fossil, from which the bed derives its name, has not been met with. It yet remains for someone to find a specimen in Yorkshire for the first time! Several have been found at Barton, Louth, and other places in Lincolnshire, and there is no reason why it should not also be obtained here.

The Middle, or flinty chalk, forms the main mass of our Wolds. Solid beds of flint, several inches in thickness, can be

traced for long distances in the sides of the railway cuttings. Fossils, however, are provokingly scarce in this middle chalk, which, perhaps, accounts for it not having received the attention that has been paid to the other beds.

The Upper Chalk does not occur near Brough.

St. Austin's Stone should be briefly mentioned here. It forms a prominent feature in Drewton Dale. It is a huge mass of chalk and flint breccia which protrudes from the dale side, and has evidently at one time filled up a fissure, as it can be traced some distance down the dale side.

The Chalk, which we have just referred to, is the last of the solid rocks we have to deal with. In the Wolds and Dales it reaches the surface and forms the subsoil. After the Chalk we have another great break, as the Tertiaries are not represented at all, neither here nor elsewhere in Yorkshire.

Capping and skirting the Chalk in one or two places are beds of Glacial age. At North Cave, Sancton, Market Weighton, Brough, and other places in the vicinity are beds of gravel, all strongly current-bedded, but all have been formed by water flowing in a southerly direction, and apparently they are connected in some way, as they resemble each other in general appearance and composition very much, varying, of course, according to local surroundings.

In a field at South Cave is a series of four or five gravel terraces resting on the Oolites. They are principally composed of chalk debris, but also contain boulders of Lias, Oolite, basalt, porphyrite, etc. Their contour is very marked and clear, and they are probably contemporaneous with the formation of the various current-bedded gravels just referred to.

As already pointed out these gravels are well distributed over this part of the country, but I will confine my remarks to those at Brough. There are two main sets, one on the low ground skirting the Humber and one capping Mill Hill.

The gravel on the top of Mill Hill appears to consist of two distinct beds of different ages. The upper gravel is, as usual, false-bedded, and chiefly composed of angular and sub-angular chalk and flint fragments, with occasional pebbles of other local rocks and a large proportion of sand. No mammalian remains occur in this gravel except such as have been included by human agency since its formation.

In the lower part of this Mill Hill section, however, in a shallow depression, there are relics of an older and entirely different bed preserved. It is composed of ferruginous sand,

firmly cemented together, and contains large boulders of ganister, Millstone Grit, etc., derived from the *west*. Of more importance is the large number of remains of extinct mammalia which have been found in it. Mr. Lamplugh several years ago recorded a tusk of a Mammoth, 10 feet long, from this pit, though it could not be removed owing to its fragile condition, and since then he has found a smaller one, with which he was more successful, and it is now preserved in the York Museum. Mr. Lamplugh soon after this second find left the neighbourhood, and since then I have worked at the pit a good deal, and, with the assistance of the workmen, have got together a large series of mammalian remains. These include teeth, portions of tusks, and a few pieces of bone of Mammoth (*Elephas primigenius*), the Straight-tusked Elephant (*E. antiquus*), *Bison priscus, Bos primigenius,* Red Deer (*Cervus elaphus*) and another species of deer, and Horse. This lower gravel and its fauna bears many points of resemblance to a deposit at Bielbecks which years ago was fully worked out by John Phillips and others, and I have elsewhere endeavoured to correlate these two deposits, i.e., the Bielbecks and lower Mill Hill series.*

The other gravels I refer to are on the low ground nearer the Humber. They consist of current-bedded sands and gravels, composed almost wholly of flat pieces of Millepore Limestone (outcrops of which occur close by), with occasional lias and other foreign stones. No mammalian remains have been found in it, and in my opinion it is of the same age as the upper part of the Mill Hill beds. A deal of work still requires to be done, however, amongst these gravels.

The British and Roman remains of the Brough district are very interesting. Two or three British interments have been unearthed, and objects of great value have been obtained therefrom. It would appear, therefore, that in British times Brough was a place of no mean importance. There is not the slightest doubt also that in Roman times there was a large station at this point. This is what might be expected, seeing that the Roman road from Lindum to Eboracum crossed the Humber here, and the ferry then existed between what is now Winteringham on the Lincolnshire side and Brough on the Yorkshire side. Naturally, therefore, Roman relics are plentiful at Brough. I have had an opportunity of examining large collections of

* Notes on *Elephas antiquus* and other remains from the gravels at Elloughton, near Brough, East Yorkshire. Proc. Yorks. Geol. and Polyt. Soc., Vol. 13, Part 2, 1896, pp. 221-231.

coins, pottery, and more rarely perfect urns, some of exquisite workmanship, which have been found in the vicinity; it is scarcely possible to dig anywhere here without turning up pieces of broken Roman pottery. A few years ago a pig of lead, with a Roman inscription upon it, was found in a field in the neighbourhood whilst ploughing.* It is very probable also that the Petuaria of Ptolemy existed where Brough now is.

There is also a famous Anglo-Saxon graveyard at Sancton, which is not far away, in which some very fine urns and other relics have been unearthed.

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The following list of papers, etc., bearing on the subject of the foregoing notes may be useful to persons requiring further information on the geology of the Brough neighbourhood :—

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SPHAGNA OF YORKSHIRE AND DURHAM.

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In the 'Journal of Botany' for 1900 appeared the '*European Sphagnaceæ*' after Warnstorf by E. Charles Horrell, F.L.S. For some time I have been studying all my gatherings of Sphagna according to this new system, and the results are given in this paper. My thanks are due to Mr. Horrell for his great trouble and kindness in verifying all the Sphagna in this list, and also to Warnstorf himself for verifying a few of them.

The new system is a difficult one, but, as it deals with morphological characters, I consider it a natural system, and one that will give great pleasure, and that can be mastered by any bryologist who will follow the directions given by Mr. Horrell as to *sections* and *staining* at the beginning of his paper.

The Sphagna I have gathered, mentioned in this paper, have the vice-county number in parentheses after the habitats, and are as follows:—

61 ... South-East Yorkshire.
62 ... North-East Yorkshire.
63 ... South-West Yorkshire.
64 ... Mid-West Yorkshire.
65 ... North-West Yorkshire.
66 ... Durham.

I.—SPHAGNA ACUTIFOLIA Schimp.

Sphagnum fimbriatum Wils. Strensall Common (62), September 1898; Terrington Carr (62), June 1898.

Var. ***robustum*** Braithw. In abundant fruit, Skipwith Common, July 1897 (61).

Var. ***tenue*** Grav. Askham Bog (64), June 1900.

Sphagnum Russowii Warnst. var. ***rhodochroum*** Russ. A very beautiful Sphagnum and, I believe, new to Britain, in bog approaching the White Force, Teesdale (65), August 1897.

Sphagnum rubellum Wils.

Var. ***pallescens*** Warnst. Leckby Carr (65), September 1898.

Var. ***purpurascens*** Warnst. Cronkley Fell (65), June 1897.

Var. ***rubrum*** Grav. Cronkley Fell (65), June 1897.

Var. ***versicolor*** Russ. Burnhope Moor, Weardale (66), July 1898; Cronkley Fell (65), June 1897; Farngill, Arkengarthdale (65), August 1900.

Sphagnum fuscum Klinggr.

Var. ***fuscescens*** Warnst. Widdy Bank (66), July 1898; moor over Kilhope Burn, Wearhead (66), July 1898.

Sphagnum acutifolium Russ. & Warnst.

Var. ***flavo-rubellum*** Warnst. Widdy Bank Fell (66), June 1897; Widdy Bank (66), July 1898; Goathland (62), August 1897; Farngill, Arkengarthdale (65), August 1900.

Var. ***versicolor*** Warnst. Strensall Common (62), April 1900; Little Punchard Gill, Arkengarthdale (65), August 1900.

Var. ***viride*** Warnst. Strensall Common (62), January 1901; Hurst Moor, Arkengarthdale (65), August 1900.

Sphagnum quinquefarium Warnst.

Var. ***fusco-flavum*** Warnst. c.fr. (very rare), White Force, Teesdale (65), June 1897.

Var. ***roseum*** Warnst. Widdy Bank (66), July 1898.

Sphagnum subnitens Russ. & Warnst.

Var. ***flavescens*** Warnst. Strensall Common (62), May 1897.

Var. ***flavo-rubellum*** Warnst. Skipwith Common (61), c.fr., July 1897; Widdy Bank (66), July 1898.

Var. ***griseum*** Warnst. Skipwith Common (61), March 1897.

Var. ***obscurum*** Warnst. Top of Langdon Beck (66), July 1896; White Force (65), c.fr., August 1897.

Var. ***pallescens*** Warnst. Pilmoor (62), September 1898.

Var. ***purpurascens*** Schlieph. Widdy Bank (66), July 1898.

Var. ***versicolor*** Warnst. Strensall Common (62), a beautiful Sphagnum, May 1897.

Var. ***virescens*** Warnst. Skipwith Common (61), August 1900.

II.—SPHAGNA SQUARROSA Schimp.

Sphagnum squarrosum Pers.

Var. ***spectabile*** Russ. Arncliffe Wood (62), an abnormal form hanging down over cliff, May 1897; moor on Burnhope Seat, Weardale (66), July 1898.

Var. ***subsquarrosum*** Russ. Askham Bog (64), June 1900.

Forma ***compacta.*** Strensall Common (62), February 1897.

III.—SPHAGNA CUSPIDATA Schimp.

Sphagnum cuspidatum Russ. & Warnst.

Var. ***falcatum*** Russ. Barmby Moor (61), August 1900; Skipwith Common (61), April 1898; Cronkley Fell (65), June 1897.

VAR. ***submersum*** Schimp. Hackness (62), July 1897; Skipwith Common (61), March 1897; Kilburn, top of Rolston Scar (62), a very fine robust form with the habit of *S. Torreyanum* Sulliv., April 1900; Strensall Common (62), December 1896; Widdy Bank (66), July 1898.

VAR. ***plumosum*** Nees & Hornsch. Source of Langdon Beck (66), July 1896.

Sphagnum trinitense C. Müll. Burnhope Moor, Wearhead (66), July 1898, with the long branch leaves toothed almost the whole length.

Sphagnum recurvum Russ. & Warnst.

VAR. ***amblyphyllum*** Warnst. Burnhope Seat, Durham (66), July 1898.

VAR. ***mucronatum*** Warnst. Leckby Carr (65), September 1898; Strensall Common (62), May 1897; moor above Ireshope burn, Wearhead (66), July 1898; Hurst Moor, Arkengarthdale (65), August 1900.

Sphagnum molluscum Bruch.

FORMA ***compacta*** Warnst. Cauldron Snout (66), in abundant fruit, July 1898; Skipwith Common (61), March 1897; Barmby Moor (61), August 1900; Hackness (62), July 1897; Goathland (62), July 1900.

IV.—SPHAGNA RIGIDA SCHIMP.

Sphagnum compactum DC.

VAR. ***subsquarrosum*** Warnst. Skipwith Common (61), March 1897; Strensall Common (62), December 1896; Barmby Moor (61), in abundance, August 1900.

VAR. ***imbricatum*** Warnst. Strensall Common (62), July 1897; Skipwith Common (61), October 1896; Hackness (62), July 1897; Goathland (62), August 1897.

V.—SPHAGNA SUBSECUNDA SCHIMP.

Sphagnum contortum (Schultz) Limpr. Skipwith Common (61), March 1897—the *S. laricinum* of Spruce.

Sphagnum subsecundum Limpr. Skipwith Common (61), March 1897.

Sphagnum inundatum Warnst. Skipwith Common (61), March 1897; Strensall Common (62), May 1897; White Force (65), June 1897.

Sphagnum rufescens Warnst. Strensall Common (62), May 1897; Skipwith Common (61), c.fr., abundant, July 1897; of exceedingly fine growth on Skipwith Common.

Sphagnum aquatile Warnst. Top of side of Langdon Beck (66), July 1898.

Sphagnum crassicladum Warnst. Skipwith Common (61), May 1897; Wheatley Wood, Doncaster (63), May 1898.

VI.—SPHAGNA CYMBIFOLIA Schimp.

Sphagnum turfaceum Warnst. Arncliffe Wood (62), May 1897.

Sphagnum cymbifolium Warnst.

Var. ***fusco-flavescens*** Russ. Skipwith Common (61), March 1897.

Var. ***glaucescens*** Warnst. Askham Bog (64), June 1900; Leckby Carr (65), September 1898; Stockton Forest (62), January 1901; Skipwith Common (61), abundant, January 1901.

Forma ***squarrosula*** (Bry. Germ.). Strensall Common (62), February 1897.

Var. ***congestum*** Schimp. Strensall Common (62), May 1897.

Var. ***glauco-pallens*** Warnst. Strensall Common (62), January 1897; Hurst Moor, Arkengarthdale (65), August 1900.

Var. ***carneum*** Warnst. Pilmoor (62), September 1898.

Sphagnum papillosum Lindb.

Var. ***normale*** Warnst. Teesdale (65), July 1896; Rolston Scar, Kilburn (62), April 1900; Burnhope Moor, Wearhead (66), July 1898; Strensall Common (62), September 1898; Goathland (62), August 1897.

Forma ***conferta*** (Lindb.) Warnst. Strensall Common (62), May 1897.

Var. ***sublæve*** Limpr. Hurst Moor, Arkengarthdale (65), August 1900; Strensall Common (62), September 1898.

Var. ***sublæve*** Limpr. forma ***glaucescens***. Skipwith Common (61), August 1900.

Sphagnum medium Limpr.

Var. ***roseo-pallescens*** Warnst. Farngill, Arkengarthdale (65), August 1900; Leckby Carr (65), September 1898.

NOTES on BIRDS.

Return of the Martin, Halifax.—I saw the first Martin (*Chelidon urbica*) of the season on Wadsworth Moor, near Halifax, 8th April.—HAROLD PICKLES, 137, Hyde Park Road, Halifax, 13th April 1901.

Arrival of Ring-Ouzel in Teesdale.—I saw the Ring-Ouzel (*Turdus torquatus*) on Cronkley Scar, Teesdale, Yorkshire, on the 7th April. The same day I saw a Peregrine (*Falco peregrinus*) and on the moors above the Merlin (*F. æsalon*).—J. F. PICKARD, Leeds, 12th April 1901.

Chaffinches in Flocks near Halifax.—At the beginning of the present month (April) Chaffinches (*Fringilla cælebs*) came into the district in large flocks. On 7th April I saw a flock of 17, and on the 8th two flocks of over 30 each.—HAROLD PICKLES, 137, Hyde Park Road, Halifax, 13th April 1901.

Uncommon Birds near Halifax.—During the last few weeks the following birds have been shot or trapped in the district:—Moorhen (*Gallinula chloropus*), Coot (*Fulica atra*), and Jack Snipe (*Limnocryptes gallinula*), near Hebden Bridge; Barn Owl (*Strix flammea*) and Kingfisher (*Alcedo ispida*) at Cragg Vale.—HAROLD PICKLES, 137, Hyde Park Road, Halifax, 13th April 1901.

Kingfishers near Huddersfield.—I have much pleasure in again recording the appearance of the Kingfisher (*Alcedo ispida*) in this district. During the last two or three weeks isolated specimens have been reported to me several times, and last Tuesday a pair of them were seen in company in private grounds, where the conditions for their nesting are all that can be desired. This bird was reported in our Meltham and Netherton district last season by Mr. Porritt, and has not been a visitor for some years previous to last season.—WILMOT TUNSTALL, Brook House, Meltham, near Huddersfield, 11th March 1901.

Bird-Notes, Lea near Gainsborough, Linc. N.—On the 16th of February last, Mr. F. M. Burton, of Highfield, Gainsborough, kindly identified some Dunlins (*Tringa alpina*) for me, which had been shot, a day or two previously, in Lea Marshes, by our butler, who secured seven out of a flock of about thirty.

The first nests of Thrush (*Turdus musicus*) and Blackbird (*T. merula*) in Lea Hall garden, found on the 11th of March, the Thrush with five eggs and the Blackbird with two; both, oddly enough, in the same yew tree.—MARGARET L. ANDERSON, Lea Hall, Gainsborough, 18th March 1901.

Glossy Ibis in Co. Durham.—An example of the Glossy Ibis (*Plegadis falcinellus*) was shot by a farm servant at Billingham Bottoms, near Stockton-on-Tees, on the 25th November 1900. I am informed by Mr. C. Milburn, of Middlesbrough, who has examined the specimen, that 'it is apparently an adult, having the beautiful shot reflections on the back; unfortunately the sex was not noted.'

Other recorded specimens in the north-eastern counties are:—Three, mentioned in Clarke and Roebuck's 'Handbook of Yorkshire Vertebrata,' and one, noted in Hancock's 'List of the Birds of Northumberland and Durham,' killed on the Coquet in Northumberland.—T. H. NELSON, The Cliffe, Redcar, 12th April 1901.

Pied Wagtails in Flocks at Louth, Linc. N.—At a recent meeting of the Louth Antiquarian and Naturalists' Society I read this note:

'There appears to be just lately a great immigration of Pied Wagtails (*Motacilla lugubris*). For the past three days my garden at the Sycamores, Louth, has been alive with them, and their numbers have increased each day. This evening (2nd March), at 5.30, I counted no less than 41 in a small space on the gravel walk and the grass mound in front of the house, and there were not less than 25 or 30 flitting about the trees and shrubs. I have been a close observer of birds all my life, but have never seen Wagtails here in flocks like this before.'—CHARLES MASON, Louth, 2nd March 1901.

NOTES on BIRDS.

Great Crested Grebes and Shelducks on the Wharfe.—On the 22nd February I saw a pair of Great Crested Grebes (*Podiceps cristatus*) on the River Wharfe, near Woodhall Bridge.

I was told by a person that, near the same place, he had seen a pair of birds which, according to his description, were Shelducks (*Tadorna tadorna*).—K. McLEAN, Harrogate, 23rd February 1901.

Boldness of a Peregrine.—On Whit-Monday, 4th June 1900, whilst spending the day botanising on and about Cronkley Fell, Teesdale, I had an interesting though rather startling adventure with a Peregrine (*Falco peregrinus*). Under the famous 'Scars' I was spending some time writing notes, when I became aware that my presence (so near their nest and probably young) was giving great annoyance to a pair of these birds, which continued to make wide sweeps out from the higher rocks, answering each other with angry calls, and with every circle becoming much bolder, and their downward flight more strikingly swift. They eventually ceased for a time, but suddenly, before I was aware, round a projecting cliff on my left swooped a grand Peregrine to within a yard of my head. She (for it was most probably the female bird) seemed exceedingly angry, and with wings and tail outspread screamed wildly and swept round above me, then sought foothold in the precipitous cliffs. She was evidently alarmed at her own near approach, for she disappeared almost immediately with as great rapidity, and I neither saw nor heard more of her. I had no idea the Peregrine would venture an attack on a human being, even in the breeding season, and can find no record of one ever doing so.—JOSEPH F. PICKARD, Leeds, 22nd January 1901.

Great Northern Diver in Cheshire.—The visits of this species (*Colymbus glacialis*) to the Cheshire meres are sufficiently infrequent to make the occurrence of two examples in January last worthy of note. On New Year's Day I spent some hours watching the wildfowl on Budworth Mere, near Northwich. Besides the Mallards (*Anas boschas*), Tufted Ducks (*Fuligula fuligula*), and Pochards (*F. ferina*) there were unusual numbers of Great Crested Grebes (*Podiceps cristatus*) on the water—I counted twenty-eight from one spot, and saw between forty and fifty of these handsome birds altogether. Of greater interest, however, than any of these was a Great Northern Diver. When I first saw the bird it was stationary, a few yards from the bank, but on my approach it drew out into deeper water. During the next few hours I got close to it several times, and was able to see something of its actions. It kept severely to itself, not associating with the Grebes or Ducks, although it often passed some of them at close quarters in swimming from one part of the water to another. Even at a distance it was easily distinguished from the Grebes by its superior size and the fact that it swam higher in the water, carrying its less slender neck bent and not erect. Many of the bird's actions, on the other hand, were very Grebe-like. It dived in the same clean fashion, and often careened on the water to preen itself, displaying the silver-white plumage of its belly and underparts. Occasionally, too, it protruded and wagged a leg above its back; and at times swam for a few feet with neck outstretched and laid on the water. When diving it usually remained below the surface for about half a minute. On the next day, Mr. T. A. Coward watched the bird, and the gamekeeper saw it daily until the 5th, when it disappeared.

On the 20th of the month Mr. F. S. Graves called my attention to a second Great Northern Diver on the mere in Alderley Park. This bird was whiter on the sides of the face and neck than the one I had seen at Budworth, and was much wilder, diving and traversing a considerable distance under water whenever we tried to approach it. It was seen on the mere for several days afterwards, and there is every reason to believe that it got away without being molested.—CHAS. OLDHAM, Knutsford, 11th March 1901.

LINCOLNSHIRE NATURALISTS' UNION AT MABLETHORPE.

R. W. GOULDING,
Louth; Assistant Secretary Lincolnshire Naturalists' Union.

The Lincolnshire Naturalists' Union, which was founded at Mablethorpe in June 1893, held its twenty-eighth field meeting in the same place on the 30th August 1900. One of the objects of the founders of the Union was the organisation of such meetings, by means of which it was hoped that isolated workers in various branches of natural history might be brought into friendly co-operation one with another, and this object has been fully attained.

The following were amongst those present:—Mr. F. M. Burton, F.L.S., F.G.S., and Mr. P. Burton (of Gainsborough); Mr. J. S. Sneath and Mr. J. E. Mason (of Lincoln); Miss Lane-Claypon (of Tytton Hall); Rev. W. H. and Miss Daubney (of Leasingham); Rev. E. R. Walker (of Billinghay); Rev. Canon Staffurth (of Freiston); Rev. J. E. Wallis Loft (of Swallow); Rev. Dr. Foster (of Authorpe); Mr. B. Crow, Mr. J. Mawer, Mr. J. Larder, Mr. T. Gelsthorp, Mr. S. Cresswell, Mayor of Louth, Mr. C. S. Carter, and Mr. R. W. Goulding (of Louth).

Many interesting things were seen, à propos of some of which many questions difficult to answer were propounded. Why, for instance, it was asked, is the *exalbida* variety of the common Garden Snail (*Helix aspersa*) confined to a comparatively small area on the sand-hills? What is the cause of the albinism of sundry specimens of *Erodium cicutarium*? Does this variety propagate itself? If it does, what is the distinction between a variety and a species? What are the habits of those curious little creatures called Chelifers or False-Scorpions? These and similar questions reminded some of those present of the inaugural meeting of the Union, and of the valuable address on the aims of such institutions delivered on that occasion by Professor Miall, F.R.S., of the Yorkshire College, Leeds. Whilst recognising the desirability of knowing the names of various plants and animals found in different localities, he pointed out that a mere knowledge of names was not enough. Animals and plants were chiefly interesting because they were or had been alive, and knowledge of them meant knowledge of their habits and life histories. 'I think,' said the Professor, 'that the young naturalist can hardly go wrong if he takes

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seriously to heart this one maxim: that he is to study plants and animals as *living things*. If he studies structure let him incessantly recall that these tissues and parts are the organs of a living animal or a living plant. How are they meant to act—why are they found in this organism and not in that? If he collects, let him try to find out why a particular aquatic insect, for example, is found in this stream and not in the next.' Human interest, he continued, readily attached to things that had a history. 'The chalk hills, the raised beaches, the straths of sand and mud—how did they come to be what they are? If your curiosity is roused about anything, try to express it in the form of a question. What is it that you really want to know? The effort to solve a question that has been put into distinct words is seldom thrown away. The very statement of the question reveals whether it is worth answering or not.'

Professor Miall's suggestions are as valuable to-day as they were when he made them seven years ago. But the truth that he enforced, viz., that it is only by intelligent inquiries of this sort that a knowledge of nature can be obtained, was fully realised by the great naturalists of past generations, whose books are still of interest and utility because they embody the results of careful, patient, and critical observations. 'What make ye of Parson White in Selborne?' asks Thomas Carlyle. 'He had not only no great men to look on, but not even men; merely sparrows and cock-chafers; yet has he left us a *Biography* of these; which, under its title 'Natural History of Selborne,' still remains valuable to us; which has copied a little sentence or two *faithfully* from the Inspired Volume of Nature, and so is itself not without Inspiration.' To take another example, of earlier date—the eminent John Ray, writing in 1667 to his friend Martin Lister at Burwell, tells him: 'You have taken the right course and method; that is, to see with your own eyes, not relying lazily on the dictates of any master but yourself, comparing things with books, and so learning as much as can be known of them.'

Martin Lister's name brings us back to Mablethorpe and some of the plants that grow there, the most conspicuous shrub on the hills being the Sallow-thorn or Sea Buckthorn, about which it is interesting to know that more than two hundred years ago Lister communicated to Ray a note of its plentiful occurrence 'on the sea-banks on Lindsey-Coast.' It is also interesting to recall the fact that he has placed it on record that in his time another plant growing plentifully on the same coast

was the Wild Asparagus; it still grows there, and was among the plants noticed by members of the Union on the day of the excursion. Other plants seen on the banks were:—*Lactuca virosa* (Wild Lettuce), *Erigeron acre* (Blue Fleabane), *Polygala vulgaris* (Milkwort), *Trifolium arvense, T. scabrum, Erodium cicutarium.* The drain-sides yielded:—*Samolus valerandi* (Brookweed), *Apium graveolens* (Celery), *Picris echioides* (Ox-Tongue), *Lychnis vespertina, Œnanthe fistulosa, Rumex conglomeratus, Juncus articulatus, Scirpus maritimus, Mentha aquatilis, Carum segetum, Carex distans.*

The rayless form of Ragwort (*Senecio jacobæa-flosculosus*) was noticed as occurring in the same locality where it was pointed out by Mr. Arnold Lees several years ago. *Lemna gibba, Alisma plantago, Cnicus lanceolatus, Carduus nutans, Papaver somniferum, P. dubium*, and *Senebiera coronopus* (Wart-Cress), the last named being on the roadside near the station, were also found. In all some seventy species were recorded by the botanical section, which was led by Mr. Crow, Mr. Larder, and Mr. Sneath.

Another section, under the guidance of Mr. Burton and Mr. Carter, paid attention to Geology, Molluscs, and Zoophytes. This section visited the exposure of clay on the beach, and obtained sub-angular pebbles with striated surfaces bearing unmistakable evidence of glacial action. They observed living specimens of Sea-Urchins and the following marine shells, as well as some commoner species:—*Pholas candida, Mya truncata, Scrobicularia piperata, Tellina solidula, T. tenuis, Syndosmya alba, S. prismatica, Solen siliqua, Mactra stultorum* (also white var.), *M. solida, Cardium pygmæum* (single valve), *Pecten varius, P. tigrinus* (worn valve), *Trochus cinereus, T. zizyphinus, Modiola modiolus, Murex erinaceus.* The land-shells seen included:—*Helix aspersa* vars. *exalbida, flammea, zonata,* and *conoidea, H. nemoralis* vars. *castanea* and *rubella, H. caperata* and var. *ornata, H. pulchella* and var. *costata, Pupa umbilicata, P. marginata.*

The following is Mr. Burton's list of the Zoophytes:—*Sertularia abietina, S. argentea, S. operculata, S. filicula, Flustra foliacea, F. truncata, F. securifrons, Hydrallmania falcata, Bugula avicularia, B. plumosa, Plumularia setacea, P. pinnata, Halecium halecinum, Antennularia ramosa, Gemellaria loricata, Obelia gelatinosa, Vesicularia spinosa, Diphasia pinaster, Tubularia indivisa, Crisia eburnea* (on *Flustra foliacea*), *Cellularia reptans* (on *Flustra foliacea*), *Hydractinia echinata, Membranipora mem-*

branacea (on stones, sea-weeds, etc.), *Alcyonium digitatum, Alcyonium parasiticum, Actinia mesembryanthemum, A. coriacea.*

The butterflies observed on the wing were the Painted Lady (*Vanessa cardui*), the Wall (*Satyrus megæra*), the Common Blue (*Lycæna icarus*), the Small Copper (*Polyommatus phlœas*), and the Small Heath (*Chortobius pamphilus*). The principal beetles were: *Agelastica halensis* (extremely abundant), *Coccinella 22-punctata, C. 11-punctata, Notoxus monoceros* (the Rhinoceros Beetle), *Lagria hirta, Calathus mollis, C. cisteloides, Anomala frischi, Crypticus quisquilius, Choleva tristis, Otiorhynchus ovatus, Cneorhinus geminatus, Sphæridium scarabæoides, Trechus minutus, Oxyporus rufus, Geotrupes spinifer, Sitones hispidulus, Broscus cephalotes, Hypera punctata, Philonthus politus, Dromius linearis,* and *Ægialia arenaria.*

The entomologists also captured a variety of other insects which (together with some taken on the sand-hills a few days previously) have been identified by the Rev. A. Thornley, of South Leverton. These included three Dragonflies (*Sympetrum striolatum, Lestes sponsa,* and *Agrion puella*), a Sawfly (*Athalia rosæ*), two abundant Grasshoppers (*Stenobothrus bicolor* and *S. parallelus*), two Ants (*Myrmica rubra* and *Lasius flavus*), and the following Flies:—*Machimus atricapillus, Chrysops cæcutiens, Tetanocera punctulata, Sepedon sphegeus, Dilophus febrilis, Oliveria lateralis, Sphærophoria dispar, Sarcophaga carnaria, Philonicus albiceps, Rhingia rostrata, Lucilia sericata, L. cornicina, L. cæsar, Eristalis tenax, E. arbustorum, Syritta pipiens, Myospila meditabunda, Scatophaga stercoraria, Ptychoptera contaminata.*

The records also included:—False-Scorpions (Chelifers); a curious "Sea-Spider" found by Mr. Carter, which seems to correspond with *Pycnogonum littorale,* figured in Nicholson's 'Manual of Zoology'; and several specimens of the Common Lizard (*Zootoca vivipara*). The Chelifers have been identified by the Rev. O. Pickard-Cambridge as *Chelifer latreillii* and *Chthonius rayi.*

In the afternoon, after tea, the usual meeting for discussion of the day's proceedings was held, brief remarks being made by Mr. Burton, Mr. Sneath, Mr. Crow, Mr. Carter, and Mr. R. W. Goulding, who communicated to the meeting apologies for non-attendance from the Rev. J. Conway Walter (President), Rev. E. A. Woodruffe-Peacock (Organising Secretary), both of whom were absent owing to ill-health, and also from the Rev. A. Thornley, who was lecturing in Edinburgh.

NOTES on LINCOLNSHIRE BIRDS.

Occurrence of Birds in Lincolnshire.—The following uncommon birds have recently occurred in our county, and are now being stuffed by Mr. Nash, successor to Mr. A. Fieldsend, at Lincoln :—

Bohemian Waxwing (*Ampelis garrulus*). One shot on Lincoln West Common early in February of this year.

Marsh Harrier (*Circus æruginosus*). Now very rare; in the parish of Laneham, near the Trent, a female.

Great Skua (*Stercorarius catarractes*). One shot at Gibraltar Point, near Skegness, 3rd January.—J. Conway Walter, Langton Rectory, Horncastle, 9th March 1901.

Cuckoo Reared by Wagtails: Kirton-in-Lindsey.—Mr. John Nicholson told me to-day that in 1895 a Cuckoo (*Cuculus canorus*) was reared by a pair of Wagtails (*Motacilla lugubris*) at Stanniwells. After the bird left the nest it was most amusing to see the exertions made by the foster-parents to satisfy its voracity. They spent their days in running, skipping into the air, and flying about to obtain beakfuls of insects for the glutton. At the end of August, though it had the full use of its wings, they were still feeding it. One day it flew fearlessly across the garden when there was a garden-party, and perched on the back of a seat near the summer-house. Between thirty and forty people then watched the efforts made by the Wagtail to satisfy its hunger. 'Gowk' means a Cuckoo, and also a foolish person, in northern dialect. Has the second use of the word reference to the young Cuckoo's apparent inability to find its own food long after it leaves the nest?—Mabel Peacock, Dunstan House, Kirton-in-Lindsey, 23rd June 1900.

Habits of the Blackbird.—Extracts from a Lincolnshire diary, 18th May 1897 :—

'In the evening, while it was still quite daylight, a confused babbling of bird-voices began outside the west window of the drawing-room. On looking out, I saw a cock Blackbird (*Turdus merula* L.) on the border below the window-ledge between the tufts of pinks. With him were four young ones and two inquisitive Sparrows. He seemed to be scolding and fussing to persuade his reluctant family that it was roosting-time, while they were crying out, 'Oh, father, not yet!' and the Sparrows were saying, 'Go along to bed, do!' I never saw a hen more anxious over her chickens than he was over his birdlings. It was such a quaint sight that I called F. to see it, and we watched him lead the brood round the corner of the house, over the little grass-plot, and into the yew-hedge where they were hatched. Presently he came out again to enjoy a little quiet on the lawn alone. The young ones left the nest more than three weeks ago. F. believes it to be quite a month since they quitted it—yet here is the father protecting and ruling them still, though they are almost as big as he is. Last week one of the young ones got himself lodged in the broken heating-pipe in the greenhouse. The watchful father was sitting near the pipe when I went in to do some potting, and nearly killed himself with dashing at the glass, he was so scared by my approach. Finally he dropped to the ground quite stunned, and both F. and I thought he would die, but after a while he began to recover, and, while he was still too dazed to be afraid, I drove him gently into the garden. Then the wretched prisoner in the pipe began to lament his fate, so he, too, was released, and sent to find his kindred again. The mother must have been occupied with a second set of eggs. I cannot help wondering whether the male Blackbird is usually such a careful protector of the first brood? I wonder, too, where the birds find water? Do they drink morning-dew on the dry days? There are no little runnels here, and they would scarcely fly into our walled-in backyard, or creep under the door to sip at the pump-trough, on account of the Cat. (Frogs and Toads do visit this trough, and sometimes fall through the cellar window near it.) On the top of the cliff there are few natural springs or ditches with a flow of water; how then do birds slake their thirst?—Mabel Peacock, Dunstan House, Kirton-in-Lindsey, 23rd June 1900.

NOTES on FLOWERING PLANTS.

***Mentha rotundifolia* in North Lancashire.**—Thos. Lawson, writing to Ray, from Great Strickland, 9th April 1688 (first printed in Derham's 'Philosophical Letters,' 1719, p. 213 et seq.), records '*Mentastrum folio rugoso rotund.* J.B. by Marsh Grainge in Lancashire' (l.c. p. 219). The species (*Mentha rotundifolia* Huds.) has never, so far as I know, been refound in Furness, or, if so, it is in no list which I have seen. Marsh Grange is between Askam and Kirkby Stations on the Furness Railway, and near the coast.

On 9th August I was on the road between Ulverston and Greenodd, and at the triangle where the road to Newland and the 'Falls' leaves the high-road, on a piece of rough ground, I found *M. rotundifolia* in plenty. A specimen forwarded to Mr. W. Hodgson, A.L.S., received his confirmation of name. The specimens fit almost exactly the plate 4 in Sole's 'Menthæ,' 1798.—S. L. PETTY, Ulverston, 28th August 1900.

***Pulicaria dysenterica* in North Lancashire.**—Some time ago I recorded *Pulicaria dysenterica* Gærtn. from Walney Island, in confirmation of Lawson's record for the species in North Lancashire. It has never been seen, so far as I am aware, in Lawson's original station by the coast on the mainland of Furness. Here is his chronicle of it:—'*Conyza media* Ger. By Aldingham in Furneis.' Westm. Notebook, 1889, Part 8, p. 185 (No. 235). I saw what I took to be this in 1887, from a railway carriage, journeying between Ulverston and Greenodd. This year (13th August 1900) I was able to visit the locality—the third field from Greenodd towards Ulverston—and found the species in quantity, and good in both flower and foliage. It is put on record here as a mainland station, as my other was on Walney. Lawson's record is from his 'Notebook,' circ. 1680, and the quotation above is from Mr. J. A. Martindale's 'Extracts,' in the Westmorland Notebook.—S. L. PETTY, Ulverston, 28th August 1900.

NOTES on MOSSES and HEPATICS.

***Sphagnum laricinum* in the East Riding.**—I found the very rare *Sphagnum laricinum* Spruce on Skipwith Common, 12th March 1897, but it has remained unidentified until the present. Mr. E. C. Horrell, F.L.S., has verified it. I believe it to be new to the East Riding.—WM. INGHAM, York, 19th March 1901.

***Hypnum pratense* as a Yorkshire Moss.**—Although I sent this name to Mr. Marshall (see 'Naturalist,' March 1901, p. 67) with very high authority, I wish it to be held over for the present. There is very strong evidence that it is not *H. pratense* Koch, although it looks like it in habit. Its proper position seems to be *Hypnum arcuatum* Lindb. var.—WM. INGHAM, York, 19th March 1901.

Mosses and Hepatics in the Brigg District, Linc. N.—The Rev. W. W. Mason was at Cadney from the 14th to the 18th February. When it was not snowing the snow was melting. We went out every day, and as a result sent 4 lbs. weight of mosses to Miss S. C. Stow. She writes: 'There were 35 species of mosses in your parcel. *Mnium undulatum* L. was very fine; and all the specimens were in good condition. This makes such a difference when one has to name them. Several species had not been recorded for Div. 3 before; and *Eurhynchium crassinervium* B.&S. is a second record of N. Lincs., though it has been taken frequently in S. Lincs. Of the six Hepatics you gathered *Lophocolea heterophylla* Nees is new to N. Lincs., and it has only been recorded once for the South. *Frullania dilatata* L., *Radula complanata* L., and *Pellia epiphylla* L. are first records for Div. 3.' It is pleasant to know that in the most 'beastly' weather one's outdoor industry is not altogether thrown away.—E. ADRIAN WOODRUFFE-PEACOCK, Cadney, Brigg, 11th March 1901.

NOTES on MOLLUSCA.

***Helcion pellucidum* in Cumberland.**—As very few records exist of Cumberland marine mollusca, it may be of interest to record two examples of this shell found among seaweed between Parton and Harrington.—Jas. Murray, 11, Close Street, Carlisle, 23rd February 1901.

***Trochus zizyphinus* var. *lyonsii* on the Yorkshire Coast.**—This *Trochus* is not common on the Yorkshire coast even in the type form, and the albino variety (*lyonsii*) appears to be exceedingly rare. I found a fine live specimen in the South Bay at Scarborough last Monday, 4th February, the first I have ever come across on this coast.—W. C. Hey, West Ayton, Yorkshire, 10th February 1901.

Albinism in Mollusca at Hubbard's Hill, Louth.—The following examples of albinism (species and varieties) were collected at Hubbard's Hill during the season 1900:—

Hyalinia pura var. *margaritacea*. Fairly common.
Hyalinia crystallina. Common.
Helix pulchella. Common.
Helix arbustorum var. *albina*. One specimen.
Helix rufescens var. *alba*. Two specimens.
Helix ericetorum var. *alba*. Fairly common on the slope at the S.W. end.
Bulimus obscurus var. *albina*. Fairly common. I have seen these some 15 to 20 feet from the ground on the trunks of the ash trees. They are generally coated with mud, resembling the bark of the trees, therefore requiring careful search.
Achatina acicula. Three specimens.
Carychium minimum. Common.

—C. S. Carter, 172, Eastgate, Louth, 9th April 1901.

North Lincolnshire Slugs.—*Arion ater* and one or two of its varieties are still very common at Bottesford, while at Cadney I can only find the type. *Limax maximus* was fairly common 35 years ago under water tubs and stone troughs, but my brother Max could not obtain a single specimen last season where we had the type and at least one variety in confinement years ago. When I was about 14 years old, in moving an old tree that had blown down and been left for many years, we found an albino specimen of this species. It was of full size and milk white, without any darker lines at all. *Limax flavus* was rare but seen by us most seasons as children. I cannot remember ever having seen a variety of this species. We tried to keep the type in wooden boxes, but if I remember rightly did not succeed with it. We used to find *Agriolimax lævis* Müller under the Pink (*Dianthus*) roots in the garden. *A. agrestis* was everywhere. There were other species, *Arion minimus* I am sure from the description in Adams' Collector's Manual, but at this distance of time though we kept them in boxes to breed them I cannot be sure. Bottesford is the best neighbourhood for slugs—or shall I say the worst?—I have ever known.—E. Adrian Woodruffe-Peacock, Cadney, Brigg, 22nd April 1901.

NOTES AND NEWS.

We learn from the publishers that a work on 'Our Country's Shells: a Guide to the British Mollusca' is in the press. This is a new volume in 'Our Country's' series of which flowers, birds, butterflies, and moths have already become recognised handbooks. It is an entirely new work on a scientific basis, but of quite a popular nature. There are to be 33 full-page coloured plates of over 600 examples, illustrating every native species, and the text is further illustrated with many original diagrams of the structure of the shells and their inhabitants. It will be issued shortly by Simpkin, Marshall & Co., and the price will be 6s. The author's name, a matter of importance, is not stated, and we venture to hope that the volume will be by a really competent hand, and not merely by a book-maker.

NOTE on FUNGI.

Fairy Rings.—A correspondent asked two or three months ago if anyone would explain the process by which these are formed. I take the explanation to be as follows:—Nature is an economical agriculturist, working on sound principles. Now every farmer knows the need of 'a rotation of crops.' If the soil is not to be exhausted, the same crop (with some exceptions) should not be grown on the same ground two years running. By some 'accident,' we will say, a fungus seed is sown on a certain spot; it matters not *how* the seed is brought there; it may be conveyed in the toes of a bird's foot; it may be wind-borne, or what not; but, once sown, in due course it produces a fungus. That fungus, as it grows, exhausts its little area of the particular soil-elements which go to form it. 'Nature abhors a vacuum,' and does not encourage further growth of the same crop on the exhausted soil. When, therefore, the fungus sows its seeds, only those grow which are shed *outside* the area of the first growth. Thus an outer 'ring' is formed of the second growth, consisting of the seeds, which have fallen on what is, to them, *virgin soil.* This ring of second growth in due course sows its seeds. These again, by Nature's law, avoid the vacuum, i.e., the further exhausted area; and so again only the outer seeds, which fall on genial soil, are developed. Thus the fairy ring, year by year, expands. The fungus, by its own decay, gradually enriches the soil, rendering it again fertile in the elements once extracted; and so we sometimes see fairy rings intersecting; but the whole process is the result of two great natural laws, the need of 'a rotation of crops' and 'Nature's abhorrence of a vacuum.'—J. CONWAY WALTER, Langton Rectory, 11th March 1901.

NOTE on YORKSHIRE FORAMINIFERA.

Foraminifera Found in a Gathering of Sand from Bridlington.—The following is a list of the species of Foraminifera found in a few ounces of this material kindly submitted to me by Mr. R. H. Philip, of Hull. The fossil forms are marked *:—

Biloculina depressa d'Orb.
Spiroculina limbata d'Orb.
Spiroculina grata Terq.
Miliolina seminulum Linn.
Miliolina contorta d'Orb.
Miliolina oblonga Montagu.
Miliolina trigonula Lamk.
Miliolina secans d'Orb.
Miliolina circularis Bornem.
Miliolina bicornis W.&J.
Miliolina ferussacii d'Orb.?
**Textularia globulosa* Ehr.
Verneuilina polystropha Rss.
Bulimina pupoides d'Orb.
Bulimina elongata d'Orb.
Bulimina subteres Brady.
Bulimina marginata d'Orb.
Bulimina fusiformis Will.
Bolivina textilarides Rss.
Bolivina robusta Brady.
Bolivina plicata d'Orb.
Cassidulina lævigata d'Orb.
Lagena sulcata (W.&J.) var. *interrupta* Will.
Lagena williamsoni Alcock.
Lagena squamosa Montagu.
Lagena squamosa var. (very near *L. melo* d'Orb.).
Lagena lævigata Rss.
Lagena lucida Will.
Lagena orbignyana Seg.
Marginulina glabra d'Orb. A rough var.?
Planorbulina mediterranensis d'Orb.
**Globigerina cretacea* d'Orb.
**Globigerina lumena* d'Orb.
Discorbina globularis d'Orb.
Discorbina rosacea d'Orb.
Discorbina wrightii Brady?
Truncatulina lobatula W.&J.
**Truncatulina?*
Pulvinulina repanda (F.&M.) var. *concamerata* Montagu?
Rotalia beccarii Linn.
Nonionina depressula W.&J.
Nonionina scapha Will.
Polystomella striatopunctata F.&M.
Polystomella crispa Linn.

—F. W. MILLS, Thornleigh, Huddersfield, 16th March 1901.

LINCOLNSHIRE WATER MITES:
SECOND LIST.

C. F. GEORGE, M.R.C.S., etc.,
Kirton-in-Lindsey, Lincolnshire.

I HAVE great pleasure in sending the following additions to my list of Lincolnshire Freshwater Mites, published in 'The Naturalist,' August 1900, pp. 253-5. All the species I mention in this paper have been found in the vicinity of Kirton-in-Lindsey, in District 5 East, of North Lincolnshire, within a short drive of this place, and never more than seven miles away.

WATER MITES—HYDRACHNIDÆ.

Atax intermedius (Kœnike). Found parasitic in the gills of freshwater mussels taken from the river Eau in this parish. For a short description of this mite, with figures of the tarsus and genital plates of the female, see Mr. Soar's paper in 'Science Gossip,' June 1900, p. 18.

Curvipes aduncopalpis (Piersig). For figure see 'Science Gossip,' March 1891, p. 295.

Piona latipes (Müller). See 'Science Gossip,' July 1900, pp. 48-49, for description of this curious and beautiful mite and a figure of the hind leg of the male.

Arrenurus mediorotundata (Sig. Thor.). See 'Science Gossip,' January 1901, p. 230.

Arrenurus geminus (n. sp.). For figures and description see 'Science Gossip,' March 1891, p. 203.

Arrenurus soari (n. sp.). See 'Science Gossip,' March 1901, p. 294.

Arrenurus robustus (Kœnike). Figured in 'Science Gossip,' March 1901, p. 295.

Arrenurus tricuspidator (Piersig). This mite has not yet, I believe, been figured in any English work, but a figure is to be found in Piersig's great work on German Water Mites, plate 43, figure 127.

Eylais soari (Piersig). See 'Science Gossip,' December 1900, p. 203.

Thyas venusta (Koch). See Piersig, plate 43, figure 127.

1901 May 2.

CORRECTIONS.—The list of Water Mites published in 'The Naturalist,' last August, requires a little correction. *Arrenurus compactus* Piersig should be *Arrenurus ornatus* (George), see 'Science Gossip,' December 1900; *forficatus* should have been *forpicatus*; also *Piona flavescens* Neuman is synonymous with *Pionopsis lutescens* (Hermann), and the latter name only should be retained.

NOTES on SPIDERS.

Two Spiders New to Cumberland.—Among a number of spiders taken near Carlisle, and kindly named for me by Mr. Frank P. Smith, of Islington, London, were two which are not included in the list published by the Rev. F. O. Pickard-Cambridge in 'The Naturalist' for 1895. Both species are, however, recorded from Northumberland. The first, *Lycosa cinerea* Fabr., was found among gravel on the Caldew, just below the level crossing near Dalston. The other species was *L. picta,* from Gelt.—JAS. MURRAY, 11, Close Street, Carlisle, 23rd February 1901.

***Tigellinus furcillatus* in the Wessenden Valley, York S.W.**—In the Wessenden Valley, west of Huddersfield, on 10th June 1900, I had the good fortune to take, from the grass surrounding an imbedded stone, a specimen of this extremely rare British spider (*Tigellinus furcillatus* Menge). It was a full-grown male and showed to perfection the strangely-shaped caput and curiously-placed eyes, for which that sex of this species is so remarkable. I could not identify it at the time, but have now done so by means of the 'Introduction to British Spiders,' in course of publication in 'Science Gossip.' To the author, Mr. F. P. Smith, I am indebted for the following information respecting its distributional range:—On the continent it has been found in France, Prussia, and Belgium, and near Nuremburg and Cracow; in the British Isles, Simon, the noted French arachnologist, records it from near London, no precise locality being given.—WM. FALCONER, 42, Varley Road, Slaithwaite, Huddersfield, 16th March 1901.

NOTE on REPTILES.

Snakes in the North of England.—Dr. Gerald Leighton, of Grosmont, Pontrilas, near Hereford, is at present engaged in preparing a book on British Snakes, and is anxious to make a comparison of the average length and relative frequency of the Adder and Ring Snake in the different counties and localities, and has written to me (and probably to others) for such information as regards this county, to which I have replied. It has occurred to me that as this is a subject which has not many admirers, and consequently not so well studied as it ought to be, there may be some readers of this periodical who could add something regarding these two species of snakes from their own locality, and who may not have received a query from Dr. Leighton. For this reason it seems fit to call attention to the work, and ask them, if they can add anything, to forward it for insertion in this magazine—and I, for one, would like to see a return of the relative frequency and average lengths of such reptiles in the northern counties of England. I herewith append Dr. Leighton's queries and my answers for Durham as far as my own observations go:—1. Which Snake is the most common in the county of Durham? The Common or Ringed Snake (*Coluber natrix*). 2. What is the average length of the Adder here? From 20 to 24 inches. 3. What is the average length of the Ringed Snake here? From 24 to 30 inches. 4. Does the Smooth Snake occur to your knowledge? No.—J. W. FAWCETT, Satley, Darlington, 2nd January 1901.

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with the co-operation of
Dr. Josef F. Babor; The Rev. A. H. Cooke, M.A., F.Z.S.; Charles Hedley, F.L.S.; E. R. Sykes, B.A., F.Z.S.; B. B. Woodward, F.G.S.

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Bootham School (York) N.H.Soc.—67th Annual Report, Jan. 1901, 8vo. [The Society.
Manchester Microscopical Soc.—Trans. and Ann. Report, for 1900. [The Society.
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N. American Fauna, No. 18, 20th Sept. 1900: Revision of the Pocket Mice of the Genus Perognathus, by Wilfred H. Osgood. [U.S. Dept. Agric.
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E. W. Swanton.—Nature Notes, a set of monthly sheets. [Chas. Mosley, publisher.
E. Merck, Darmstadt.—Annual Report on the year 1900 [in pharmacy], 8vo., March 1901. [Publisher.
J. E. Harting.—Handbook of British Birds, new edition, 8vo. cloth, 1901. [J. C. Nimmo, publisher.
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H. Marshall Ward.—Grasses, a Handbook for use in the Field and Laboratory, 8vo. cloth, 1901. [Cambridge University Press.

OCCURRENCE OF THE OSPREY IN LINCOLNSHIRE, WITH SOME NOTES ON THE KITE.

F. M. BURTON, F.L.S., F.G.S.,
Highfield, Gainsborough, Lincolnshire.

Last February, Mr. Sutton Nelthorpe, of Scawby Hall, the owner of the Twigmoor Gullery, told me a rare bird had been shot in his grounds which he believed to be an Osprey, and, on my writing to him afterwards for particulars, he kindly asked me over to see it.

The bird was then in the keeper's cottage, and, after a drive through the gullery wood, we went there to inspect it. As to its identity, there is not a shadow of doubt. It is a fine Osprey (*Pandion haliaëtus*), in good plumage. It was placed over a door in one of the cottage rooms, with its wings extended, and looked a noble bird indeed. The place where it was shot is a piece of ornamental water, not far from Scawby Hall, partly surrounded by wood. Since then I have heard from Mr. Sutton Nelthorpe with the following particulars :—

'The Osprey was shot here by the keeper, Thomas Pike, on the 10th May 1900, and stuffed by Dean Robinson, of Scawby Brook. The bird was observed for nearly a week, frequenting the lower, or easternmost pond, in the pleasure grounds here, being baited by the Brown-headed Gulls and other birds. It is a female. Inside it were found several shell-less eggs, and in its maw the bones and scales of small coarse fish. I am sorry the bird was killed, but, being abroad at the time, I had not the chance of saving its life. Had it been spared, it is just possible that, if it were one of a pair, it might have nested in the old Scotch Fir woods. I am going to have the bird put into a proper case, as an addition to the specimens that I have of the Kite, Peregrine, and Buzzard killed in Lincolnshire.'

Besides the birds mentioned in this letter, Mr. Sutton Nelthorpe told me when I was at Scawby that he had usually a Golden Oriole (*Oriolus galbula*) about, and he believed one at least came regularly.

As to Kites (*Milvus milvus*), few, living now, can imagine how common they were about half a century ago in Lincolnshire. Kingsley speaks of 'kite upon kite' being seen in the fens. The Rev. Murray A. Mathew in the 3rd volume of 'British Birds' says:—'In the middle ages it is on record that foreigners

used to be astonished at its numbers, even in London itself, where, no doubt, it was a useful scavenger.' And I can recall the time in the 'thirties' and 'forties' of the last century, and even later, when these noble birds could be seen every day round Lincoln, and in the fenland to the west. I have twice seen one fly up out of my father's garden in Lincoln (the house was then on the outskirts of the city, but is now surrounded by buildings), and I have seen as many as six or more circling round the broad tower of the Cathedral. I have watched them hawking, from side to side, over the tall Lincolnshire hedge-rows, and flying low over the fen-dykes. I remember once, in a wood near Langworth, seeing one on the branch of a tree, within twenty yards of the road, as I was riding past; and, well aware that I could not injure it, though I shouted at it to make it fly, it refused to move. No doubt its nest was not far off. The last I saw alive was mewed up in a cage hung outside one of the houses in the Castle-dykings at Lincoln, looking proudly defiant, but still very sad. And now, alas! all are gone; sacrificed to the collector and game-preserver, and to the insatiate, untaxed gunner of those days, for the sake of their money value, which increased more and more as the birds got scarcer.

To own the Twigmoor Gullery is a treasure of no mean value; but, in addition, to have an Osprey on your estate, and to be able to watch it dashing on the water for its prey—with the chance of it staying, as, let alone, it might have done—would be a unique possession indeed. When will gamekeepers allow rare birds to live? The answer is plain: when the land-owners and game-preservers—who have the matter in their own hands—insist on their lives being spared; and when that time arrives, then Osprey and Golden Oriole, Peregrine and Buzzard, with many other rare birds will be amongst us again; and, surely, the pleasure of seeing such birds and observing their habits would more than compensate for the loss of a few pheasants and partridges! Scawby woods make eloquent protest on the birds' behalf; and, as there, so everywhere, may the golden day of light and mercy speedily come.

NOTE on REPTILES.

Slow-worm near Silverdale, West Lancs.—I captured a fine example of the Slow-worm (*Anguis fragilis*) basking in the sunshine in a wood on Trowbarrow, near Silverdale, on the 11th inst.—J. A. Wheldon, Liverpool, 14th May 1901.

NOTES on MOLLUSCA.

Helix aspersa monst. ***cornucopia.***—It may be as well to put on record that a beautiful dead shell of this monstrosity was found about 1865 in the Greater Periwinkle (*Vinca major* L.) on the south side of the house at Bottesford Manor, Brigg. It was very much like the specimen figured in Taylor's 'Monograph' (1894-1900), p. 26. If my memory serves me, for I was but a boy then, the banding was (123)(45), and the apex was much denuded. What became of it I have no idea. We used to keep snails alive in boxes and breed them at the time, and this shell was a great find, but we vainly hunted for a living specimen.—E. ADRIAN WOODRUFFE-PEACOCK, Cadney, Brigg, 22nd April 1901.

Helix aspersa var. ***exalbida.***—I do not know whether this variety has been recorded for any inland station in Lincolnshire. While out as the dew was falling on 18th April 1901, studying the local banding of *H. nemoralis*, I took a denuded but only two-thirds grown specimen at Kirton, on the Redbourn road. It is the first *H. aspersa* I have seen abroad this season. Just beyond the fence from which *H. aspersa* var. *exalbida* Menke was crawling is an old but shallow quarry in the Kirton Limestone; it is my only locality for *H. itala* L. I once found a dead specimen on Manton Warren, but no other specimens rewarded a careful search.—E. ADRIAN WOODRUFFE-PEACOCK, Cadney, Brigg, 22nd April 1901.

Acmæa testudinalis **on the Yorkshire Coast.**—When I read Mr. Braim's account of his searches for this species on the Yorkshire coast, given in 'The Naturalist' for December 1900, I came to the conclusion he had not seen my notes on the species, published in the January number, 1885. He will there read of this shell: 'Unusually abundant on the Lias Scars below Huntcliff. Not uncommon on the Redcar Scars and on the south shore at Scarborough.' I noticed the species last week at Scarborough, where any collector may easily find it at the time of spring-tides, and for that reason send this brief note.

I don't think Mr. Braim is correct in speaking of the 'southward rambles' of this shell. Species extend their distribution in a northerly direction only in the northern hemisphere. Our Yorkshire race of *Acmæas* we should rather regard as laggards than adventurers.—W. C. HEY, West Ayton, Yorkshire, 10th February 1901.

Thrush Stones at Cadney, Lincs. N.—These are common enough in all parts of the country, and are constantly observed by those who have eyes that see. Stones are rare in alluvium and peat, only being found where they have been carried by man. In such places the fragments of hundreds of shells may be found together. I came across such an uncommon collection of shells the other day that, perhaps, they are worth noting. The Thirty Foot Drain at Cadney, Lincs., flows under an arch with a stone coping, which carries the towing-path, before it flows through a door into the river Ancholme. On Friday, the 29th March, there was a heavy fall of wet snow for some hours, and on the 1st April I passed along the north side of the Thirty Foot. The stonework on the landward side of the drain head has been used by a Thrush or Thrushes for breaking up snail shells. There were plenty of *Helix nemoralis*, with a few *H. aspersa*; *H. arbustorum* was in fair numbers, and *H. cantiana* represented by half a dozen specimens. These are all to be found along with *H. virgata* on the banks of the Thirty Foot. There were some very fine empty specimens of *H. virgata* vars. *typica* and *radiata*, but none had been broken as far as I could discover. They were lying amongst the débris, and one could only suppose had been carried there by the same agent which had carefully collected the other species. Along with them were empty specimens of *H. nemoralis* and *H. aspersa* more or less weathered, but these, though still entire, had been tried for their molluscs and found wanting, for they showed signs of beating. I could not detect such marks on the shells of *H. virgata*.—E. ADRIAN WOODRUFFE-PEACOCK, Cadney, Brigg, 16th April 1901.

NOTES on BIRDS.

Unusual Situation of Thrush's Nest near Bolton.—On the 11th May I flushed a Song Thrush (*Turdus musicus*) from her nest and four eggs under a heather bush on a moorland hill-side, on or close to the ground. Within a quarter of a mile were trees and grass-land.—JOHN P. THOMASSON, Bolton, 13th May 1901.

Pink-footed Goose in Co. Durham.—On 5th Feb. 1901, a specimen of the Pink-footed Goose (*Anser brachyrhynchus*) was shot at Seaton Carew, according to the local papers, by Mr. C. Braithwaite, of that place. This bird is an autumn and winter visitant to the shores of this county, arriving about October and leaving again about April.—J. W. FAWCETT, Satley, Darlington, 22nd March 1901.

Dates of Arrival of Swallow and Cuckoo at Wetwang-on-the-Wolds, 1879-1901.—I beg to forward the following notes, taken by me at Wetwang-on-the-Wolds, for a series of years. The arrival of the Swallow (*Hirundo rustica*) and the note of the Cuckoo (*Cuculus canorus*) are taken from personal observation, or from the information of one or two observers whom I have interested in the subject.

Date.	Swallow.	Cuckoo.	Date.	Swallow.	Cuckoo.
1879	April 25	—	1891	April 22	May 14
1880	April 25	—	1892	April 22	—
1881	April 16	—	1893	April 20	May 6
1882	April 21	—	1894	—	—
1883	April 26	—	1895	April 20	—
1884	April 28	—	1896	April 24	—
1885	April 17	—	1897	April 21	April 23
1886	April 26	—	1898	April 16	—
1887	April 28	—	1899	April 20	April 30
1888	April 29	May 8	1900	May 1	—
1889	April 23	May 1	1901	April 20	May 1
1890	May 3	May 6			

Formerly the Sand Martins (*Cotile riparia*) used to arrive first, but none have been seen for many years.—E. MAULE COLE, Wetwang, 3rd May 1901.

Mistle-Thrush.—This bird (*Turdus viscivorus* L.) has built in the large Sycamore (*Acer pseudoplatanus* L.) by the vicarage garden gate at Cadney for many years, except in the year of the great frost, 1895, and for a season or two afterwards. A pair this year have made their nest in a small White Thorn (*Cratægus monogyna* Jacq.) in the same fence. The position of the nest is at the forking of the branches, just such a place as the bird loves. But the bottom of the nest is less than four feet from the ground. When there were four eggs in the nest one was accidentally broken and another taken, and the birds forsook the garden for a week. Then I found they had returned, for I saw them sitting in the tree turning their heads on one side and peering into the nest. It suddenly struck me that the partially incubated and dead eggs were their trouble, and the following night I removed them. The birds are now sitting on four eggs. In all my experience of nesting I have never known the Mistle-Thrush return to a robbed nest and lay a second clutch; and can hardly believe it would have been the case in my garden had not the two bad eggs remained in the nest till they wished them removed. Though the garden is but half an acre in size, in the last ten seasons we have had Blackbirds (*T. merula* L.), Thrushes (*T. musicus* L.), Hedge Sparrows (*Accentor modularis* L.), Flycatchers (*Muscicapa grisola* L.), Wrens (*Troglodytes troglodytes* L.), Sparrows (*Passer domesticus* L.), Chaffinches (*Fringilla cœlebs* L.), Starlings (*Sturnus vulgaris* L.), and Ringdoves (*Columba palumbus* L.) nesting with us. I have seen most of our common birds at one time or another within the fences. The Tree-Creeper (*Certhia familiaris* L.) is my best record.—E. ADRIAN WOODRUFFE-PEACOCK, Cadney, Brigg, 22nd April 1901.

MAMMALIA OF BOTTESFORD PARISH AND THE NEIGHBOURHOOD.

MAX PEACOCK.

The Manor, Bottesford, Lincolnshire.

THE parish of Bottesford, where I was born, extends from the river Trent on the west to within 4¾ miles of Brigg on the east, in North-West Lincolnshire. It contains the townships or hamlets of Holme, Ashby, Bottesford, Yaddlethorpe, and East Butterwick north of the Beck—the portion of this township to the south being in Messingham parish. It lies wholly in Natural History Division 2 S. When I speak of the district in contradistinction to the parish I mean the whole of Division 2 S. The soil, starting from the west and travelling east, is warp or Humber alluvium lying on peat or blown sand, which appear from beneath it as you rise above high water level. Then two escarpments of the clays and shales of the Lower Lias. The warp keeps up its old reputation, and the loamy soils of the Lias are unusually fertile. The clays are rich pasture land where the grass is old, growing fine oak and ash. Considering how few and scattered the woods and plantations are, the parish is an unusually rich natural history neighbourhood. There is still a Decoy at Ashby, which was once surrounded by extensive plantations, and a few miles to the eastward lie the far-stretching woodlands of Appleby, Broughton, Manby, Scawby, and Twigmoor, with their heronry, gullery of 'blackheads,' and duck-pond. When I refer to my brother, the Vicar of Cadney, who is not quite unknown to the readers of 'The Naturalist,' I shall speak of him as—the Vicar.

Great Bat. ***Pipistrellus noctula*** (Schreb.). Fairly common. It frequents trees, ivy, and roofing tiles. It searches for its food nearer the ground than other species.

Flitter Mouse. ***Pipistrellus pipistrellus*** (Geoff.). Found all over the district, as well as in Bottesford parish.

Long-eared Bat. ***Plecotus auritus*** (Geoff.). Not as common as the last, but we have it about the church and elsewhere. I have taken it in the belfry, and from holes in the walls of the church. I once took one on a small fish-hook on a fine gut with natural moth.

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? Daubenton's Bat. ***Myotis daubentonii*** Leisler. Another species, which I believe to be this, I have seen hovering over the pool of the water mill, and also on the pond at Bottesford moors. I have never handled this species and so cannot be sure. The Vicar has seen it too at the water mill, but has never handled it either.

There is yet another species at Bottesford which I have both seen and handled, but of which I have kept no specimens I regret to say. I identified it to be the

? Reddish-Grey Bat (***Myotis nattereri*** Kuhl) of some authors, but am now not certain, as Mr. Caton Haigh thinks it cannot be that species. I have seen it twice, and under these circumstances. In 1890, at Yaddlethorpe there was a window, still covered with lath and plaster, which had not been re-opened since Pitt put on the window tax. A portion of the plaster had given way at one corner, leaving a tiny hole opening to the outside air through which the bats had entered. By the aid of a candle you could see them gathered together in dozens against the glass, as they hung to the rough lath and plaster. In 1896 we felled an old ash tree just above the little 'sipe-well,' where the Brigg road divides for Bottesford and Ashby. In a hollow in the trunk there were about twenty of these Bats, and some were killed by the tree falling. I also once saw this Bat in a bird stuffer's shop; I thought it was at Lincoln. I have learned it was not there; but I saw it somewhere. When it turns up again we shall know what it is for certain.

Hedgehog. ***Erinaceus europæus*** L. Found all over the parish and district. From my own personal observation I have no doubt they destroy a number of eggs, especially of game birds. They even attack sitting fowls in farm-yards. At times they will eat carrion. I saw one visiting a dead lamb left in the field. For three days it came at dusk and made a meal from it. They will also attack dead rabbits in traps. A nest was discovered in 1865 in the upper portion of the manor garden, then hardly reclaimed from woodland to which it is returning. The young ones were only a few days old. Their spines were quite soft, and they could not curl up fully, but they could make a spitting or hissing at intruders. On the following morning they were not in the nest. Could the old ones have carried them away to a new home? It is generally believed

in Lincolnshire that the Hedgehog sucks cows, and it is also said to carry off fruit, apples especially, impaled on its prickles. Persons of known accuracy and reliability are willing to bear witness to having seen these things. A few years ago my sister Mabel was told by the groom employed by a friend that, in one of his former situations, he and several other members of the family in which he lived saw a Hedgehog carrying off fruit on its spines from the orchard. I am an agnostic in regard to these two points, for I have no personal experience; but still I think them worth recording, though I am told both ideas are as old as our race.

Mole. ***Talpa europæa*** L. Has increased to a very great extent since 1865, and now nearly the whole parish is overrun with it. When I was a child they were confined to the sands and peaty soils or warp by the Trent. I saw a white one that was caught on Nocton Heath, Div. 13, South Lincolnshire. It was the second the mole-catcher had taken in 40 years spent in killing them. Those found on Crosby Warren, a little to the north of Bottesford parish, have a patch of yellow rather longer than a sixpence, but not quite so wide, on the middle of the belly. The late Sir Robert Sheffield's mole-catcher says he never finds them marked in this way anywhere else. On our warp farm, which was then 420 acres, 3,596 were killed in three years by traps. The Moles are friends to the farmer, speaking generally, but where land lies below the high water level of the river, beck, and drains they must be killed off, for they are very thirsty animals, and have a way of piercing banks just above summer water level. Their neatly-drilled runs soon expand in a flood to a wide tunnel, and finally a huge gap in the banks, through which the whole country side is flooded.

Shrew. ***Sorex araneus*** L. Found all over the parish and district.

Lesser Shrew. ***Sorex minutus*** L. Is rarely seen at Bottesford. I have found it dead in the autumn on footpaths. The best way of identifying this species in an old woodland neighbourhood is from the pellets of the Barn Owl (*Strix flammea* L.), as Mr. Lionel E. Adams pointed out in the 'Journal of the Northamptonshire Natural History Society,' June 1898.

Water Shrew. ***Neomys fodiens*** (Pall.). Rarer than the last, but is found in some of our drains. It may be seen on fine days hunting water insects. The variety called the

Oared Shrew (***Sorex ciliatus*** Sowerby) I have seen too. It is only a melanistic form, I believe.

Badger. ***Meles meles*** (L.). Is a rare visitor. One was caught in Holme on the 4th May 1900, and sent to Leeds. It was big with young. I had only heard of one before that. It had been fast in a rabbit trap for some time, but could drag the trap and chain along with it. On one side the links were worn quite bright. I cannot give even an approximate date; my regular notes from which this paper is written did not begin before 1887.

Otter. ***Lutra lutra*** (L.). Used to be fairly common, but long ago became extinct except as a casual wanderer. I have never seen one. But that it still comes to us at times there can be little doubt. A pair visited the water mill in Messingham, just out of our borders to the south, about 1868 to 1870; and one was caught in Burringham sewer, just to the north, on 3rd October 1899. Their bones have been found in the peat.

Weasel. ***Putorius nivalis*** (L.). Is common all over still. I have seen them hunting in packs like dogs. Once I saw at least twenty working a small larch plantation, and while I was watching they killed three full-grown Rabbits. You find the same thing in trapping Rabbits. For weeks you will not take a Weasel, and then have a number every morning for some days. When the Vicar and I were visiting my traps in 1891, one June morning, I had six, and but only one Rabbit. The Weasel is often taken in mole-traps when engaged in hunting galleries of the eternal digger. Rats are also taken in this way too, but very rarely compared with the Weasel.

Stoat. ***Putorius ermineus*** (L.). Not as common as the Weasel, but still may often be seen. I do not think they ever feed on the Brown Rat unless they are driven by hunger. I have seen them in one stack of corn with nests of young. There were few Mice along with them. Looking over some old notes since my return from the Argentine, I came across the following jotting, which was made about 1878, I believe:—On the boundary of the township of Yaddlethorpe, in a field called Old Chapel Close, my father

engaged men to sink a well. When it was about twenty feet deep, and still quite dry, it was left one Saturday night securely covered with planks, to prevent any sheep from a flock which were grazing on the temporary seeds from falling in. On the following Monday morning a bitch Stoat and four half-grown young ones were discovered at the bottom of the well by the returning workmen. The ganger lowered a ladder and was about to descend to kill the 'varmints,' when he remembered that Mr. Allbones, of Brigg, was taking them out to the Antipodes 'in boat loads.' Changing his purpose, therefore, he determined to catch them alive, but how best to take such lithe and active creatures puzzled all the workmen at first. After many useless attempts, a long smock with the sleeves tied up at wrists was used as a trap, and one by one all the Stoats were captured. They were quite unhurt, and were sold at Brigg the same evening for 25s.

Polecat. ***Putorius putorius*** (L.). Now very rare. One was brought in by a cat called 'Rose' when she had kittens in 1864. I saw one in the Snake Plantation, and caught it later, but its hair was coming off and it was not fit to stuff. Another was caught at Ashby Ville. There were a lot of young ones in Trafford Strip, a long, narrow plantation, in 1895.

Common Fox. ***Vulpes vulpes*** (L.). Comes to us generally as a visitor, but it bred in 1893 in Cole's Plantation. No pack of hounds hunting or ever running into this parish, the farmers and keepers round are 'dead on' them. I only saw three in the shooting season of 1889. We trapped one by his brush one night, and he left it behind and departed, to be taken again the following evening by his pad; the trap having been reset at another spot in his 'round.' This was close to Ashby Decoy, which is frequently visited by them in the 'ducking season.' When the pond there is frozen over with fine smooth ice, in the morning they sometimes catch Ducks in the very middle of the 'flight.' Once Tom Tacey found a Fox 'screeved,' i.e., lying on its body with its dislocated limbs extending on either side, in the very centre of the Ducks, which gave their ancient foe a wide berth.

Squirrel. ***Sciurus vulgaris*** L. Common in the woods of the neighbourhood. I have seen it eat fungi, and pull to pieces the decayed boughs of trees to eat the larvæ of insects—at

least I found one or two of these below. By cutting off and eating the leading shoots of young trees they are most destructive in new plantations, and have to be kept down by gun and trap. They also visit the spots where corn is thrown down for game. I have also seen them eating wheat from the ear. They eat the eggs of the Ring Dove, but whether all Squirrels do this I cannot say from experience, though there is an almost universal belief in Lincolnshire that where Squirrels are shot down the Wood Pigeon increases. They used to visit the manor garden to attack the Victoria plums; my sister Mabel once surprised one thus employed. It made off and took refuge in a large tree, and when it imagined itself quite secure, to her astonishment, it wagged its tail rapidly like an excited terrier dog. I have never seen a reference to this gift in print. Was it a personal peculiarity? I have seen five young together in a nest in the Snake Plantation; this is not common.

Harvest Mouse. ***Mus minutus*** Pallas. Very rare indeed. I have only heard of it once and seen it once. Many years before I was born, the nest old and young were taken on some light sandy land at Bottesford Moors. On the same part of the farm I saw a nest with female and young in a wheat-field in 1887.

Long-tailed Field Mouse. ***Mus sylvaticus*** L. Very common in the district, and at times, when owls and hawks are killed down, increases in numbers; in fact, at these periods they do a great deal of harm. They eat insects as well as grain and nuts. I have watched them burying acorns in the meadow fields. They seem to forget where they place them, as I have known several of these mouse-planted acorns grow.

Common Mouse. ***Mus musculus*** L. Much too common. I have seen them white, cream-coloured, and fawn. My sister Mabel saw a beautiful buff variety, which was killed by a cat amongst apples stored on the floor of the manor carriage-house. Colour forms increase when a species multiplies rapidly, or is exposed to unnatural conditions.

Black Rat. ***Mus rattus*** L. Now quite extinct, I fear, in North-West Lincolnshire. I have never seen one. But the late Brownhead Johnston, of Ashby, who was rat-catcher for this neighbourhood for over fifty years, said in 1876

that he had not seen a Black Rat for over twenty years. He had only killed five or six in his life. These were in the old thatched buildings of Bottesford and Ashby.

Brown Rat. ***Mus decumanus*** Pall. Found too plentifully, as we discover to our cost. In 1869 my father thrashed a stack of wheat in the spring, from which 162 were killed and two escaped. In 1889-90 there was quite a plague of Rats in North-West Lincolnshire. Some people thought at the time it followed on the exportation of so many Stoats and Weasels from the district to Australia; but my personal experience is that neither of them prey much on the Rat unless they are pressed by hunger. I have often found them in the same stack. I have seen a Rat kill a Rabbit in the same manner as a Stoat, seizing it behind the ear.

Water Vole. ***Microtus amphibius*** (Desm.). Common on all our becks and drains. It is a grain and plant feeder generally, but sometimes takes to a fish diet. I saw one once in the act of sucking five Water Wagtail's eggs from a nest on the beck bank. A large Trent Eel which was sent to us contained a full-grown Water Rat and a Frog.

Short-tailed Field Vole. ***Microtus agrestis*** (L.). Common on the old grass land about the higher parts of the parish and such places in the neighbourhood.

Long-tailed Field Vole. ***Evotomys glareolus*** (Schreber). Commoner than is generally believed in the woods about Bottesford.

Hare. ***Lepus europæus*** Pall. Would be common all over the district if it were left alone, but it is being killed off rapidly. I found young on 14th February 1890, and shot a doe full of young 3rd November 1886. Hares take drink nearly every day, and during dry weather I have seen them come to the same spot to water early in the morning for days together. They love the stiff clays and clay loams as much as the Rabbits the sand and sandy loams. You cannot stock heavily with both species on the same ground, for if suitable the Rabbit inevitably destroys the Hare. If a Hare gets into an enclosed rabbit warren it is soon hunted to death, first one set of rabbits taking up the chase and then another, till the Hare, obtaining no food or rest day or night, dies of exhaustion.

Rabbit. ***Lepus cuniculus*** L. All over, in every hedge and bank. On the poorest sands to keep warrens would pay

better than cultivation. From 2s. to 2s. 6d. a couple can be obtained for them. In mild open winters they continue breeding, but our climate is too damp, and they do not increase much by doing so; the damp food kills the young ones soon after leaving the nest. Fifty years ago the skins were of more value than the flesh to the breeder, and made as much as 15s. per dozen. The skins of the silver-haired variety were then making 25s. per dozen. A hundred years ago the best skins of this variety were sometimes worth 3s. 6d. each. They were sent to Russia. The busbies of the hussars in that country were for many years made of this fur, and caused the great demand. The figures are taken from old account books. The type, black, and silver-haired varieties are still found, but the quality of the latter is not 'pure' now in the Bottesford district I am told.

Red Deer or Stag. ***Cervus elaphus*** L. Has long been extinct, but must have been plentiful at one time. We find its bones and antlers in the peat and in the beck, or still embedded in the banks.

Fallow Deer. ***Cervus dama*** L. Has been seen passing through the parish. An escape no doubt from Normanby or Brocklesby Parks. I have never heard of its bones in the peat.

Wild Cattle. ***Bos taurus*** L. The bones of Wild Cattle are frequently found in the peat and beck. The head and horns are unlike those of any domestic cattle known to me, but have a strong resemblance to the Chillingham breed. The horns take the same sweep as the bulls from that park, but are rather shorter and thicker. The bones are bones still, not fossils.

Bottle-nosed Whale (***Hyperoödon rostratus*** Chemn.) as the Trent-siders call them, was seen by the Vicar between Amcotts and Keadby in 1877. They were known to be in the Humber at the time, he only saw one, and not more than 15 feet of it, but there can hardly be a doubt as to what it was. A few days after some were in the Ouse he heard.

Porpoise. ***Phocæna phocæna*** (L.). Comes up the river Trent every year after the Salmon. I have seen three shot with rifles. At Butterwick, in 1891, a specimen measured 5 feet 6 inches.

SOME LAKELAND HOST-PLANTS AND PARASITES.

Rev. HILDERIC FRIEND,
Author of 'Flowers and Flower Lore,' Chichester.

It is now upwards of a decade since I first began the study of Lakeland micro-fungi. During that period I have examined many hundreds of specimens collected by numerous botanists, besides having worked many parts of the district carefully in person, and the following notes are the partial outcome of my extensive observation. Had it been possible I would gladly have included in this list of localities the records of the late Dr. Carlyle, of Carlisle. For many years he had diligently collected the fungi which grow around the Border City, and he had a large list of local habitats, but the records are not at my command, except such as I was able to make during the three years of my residence in Carlisle, when we frequently went fungus hunting together, or exchanged notes on species and habitats.

Many methods of cataloguing the leaf parasites have been adopted, but so far as I am aware no English records have been made on the following lines. Often in my amateur days as a collector did I wish for a list of host plants with the names of the parasites which infested them, and many a time have I formed the purpose to issue such a catalogue for the British Flora. The work, however, like many others, is still potential only, and will probably never pass, in its entirety, beyond that mood. The list which I now submit indicates the lines on which I should proceed, and may, perhaps, be the means of helping towards the realisation of the end I have so long had in view. As I have entered no names except such as I can guarantee, no authorities are quoted. I may, however, state that I have incorporated the records made by Mr. Waddell and Mr. Atkinson in the 'Westmorland Natural History Record,' I., pp. 61, 90, as I have had an opportunity, either of seeing the critical species, or verifying the records during my visits to the localities (Kendal and Bowness). What I did not personally collect were chiefly submitted to me by Dr. Arminson, of Lytham; Miss Ripley and Mr. Wyatt, of Lancaster; Mr. Thomson, of Carlisle; Rev. C. H. Waddell, of Kendal, and other personal friends.

I give first the name of the host plant, arranged in the usual order, then the name or names of the parasites with which they may be affected, following the nomenclature of Plowright in his 'British Uredineæ and Ustilagineæ.' The parasites named are

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almost exclusively confined to these groups, but the list might be greatly extended if other groups were included. The immense variety and great richness in the development of plants in Lakeland renders the district a peculiarly interesting one for the student of microscopic fungi, and no doubt many additions might be made to the species, while many new habitats might be recorded, if only a few of the many botanists who yearly frequent this popular resort were to make note of the forms they observe.

Meadow Rue (***Thalictrum flavum*** L.). Clustercup (*Æcidium thalictri-flavi* DC.) found June 1887, at Silverdale and Whitbarrow Scars.

Wood Anemone (***Anemone nemorosa*** L.). Yields several parasitic fungi, including (1) the Clustercup (*Æ. leucospermum* DC.), found in Wreay, Wetheral and Cunswick Woods, and at Orton Moss. (2) Brand (*Puccinia fusca* Relhan), collected at Carlisle, Wreay, Bowness, and Kendal. (3) Smut (*Urocystis anemones* Pers.) from Carlisle, Cummersdale, and Silverdale. (4) Mildew (*Synchytrium anemones* Wor.) in Gelt Woods and N.E. Lancs. (5) Mould (*Peronospora pygmæa* Ung.), Cunswick Wood, Kendal.

Celandine (***Ranunculus Ficaria*** L.) yields (1) the Clustercup (*Æ. Ficariæ* Pers.) in great abundance wherever sought in April or May. Carlisle, Kirkbride, Cockermouth, Great Broughton, Corby, Silloth, Kendal, Ambleside, Lancaster. (2) Rust (*Uromyces Ficariæ* Sch.) at Dalston, Cockermouth, Eaglesfield, Kirkbride, Wreay, Penrith, Grange, Bowness, Kendal, Ulverston, Lancaster. (3) Mildew (*Entyloma Ranunculi* Bon.) found at Carlisle, Kirkbride, Eaglesfield, Cockermouth. (4) Mould (*Peronospora Ficariæ* Tul.) at Cockermouth, Blackwall, Kirkbride.

Bitter Crowfoot (***Ranunculus acris*** L.). Sometimes attacked by a Clustercup. As the records are not so exact as they should be, all the habitats are for the present given under the next, as the fungus chiefly affects it.

Creeping Crowfoot (***Ranunculus repens*** L.). (1) Clustercup (*Æ. ranunculacearum* DC.) found at Holmehead, Carlisle, Wreay, Kirkbride, Bowness. (2) Smut (*Urocystis pompholygodes* Lév.), at Carlisle, Grinsdale, Bowness, and Patterdale. (3) Blight (*Erysiphe communis* Schl.), exact localities not recorded.

Bulbous Crowfoot (***Ranunculus bulbosus*** L.). See two foregoing entries.

Marsh Marigold (***Caltha palustris*** L.) is infested by (1) a Clustercup (*Æ. Calthæ* Grev.), found at Kendal and Pooley Bridge; and (2) a Brand (*Puccinia Calthæ* Link), also found at Pooley Bridge and Kendal. I have found the latter in abundance at Lochmaben and Helensburgh.

Columbine (***Aquilegia vulgaris*** L.). The Clustercup (*Æ. Aquilegiæ* Pers.) found at Silverdale.

Barberry (***Berberis vulgaris*** L.) is affected by (1) a Clustercup (*Æ. berberidis* Pers.) which is of classical notoriety. Though abundant at Ruthwell and Dumfries, north of Lakeland, and equally plentiful further south, I have not yet observed it or heard of its occurrence in the district, though I have examined every plant I have seen. Dr. Carlyle informed me in 1887 that though he had often examined the barberry in many localities he had never found the parasite which causes the mildew in corn. (2) Blight (*Microsphæria berberidis* Lév.) found at Portinscale and Southwaite.

Wallflower (***Cheiranthus cheiri*** L.) is affected by (1) a Mould (*Peronospora parasitica* Pers.) which is parasitic on (2) the White Rust (*Cystopus candidus* Lév.). Found April 1888 near Carlisle.

Bitter Cress (***Cardamine hirsuta*** L.). The seedlings subject to attack from white rust (*C. candidus* Lév.). Nurseries at Stanwix, Carlisle. See two following paragraphs.

Horse Radish (***Armoracia rusticana*** (Rupp.), attacked by white rust, which covered the leaves with very large patches, having the appearance of drops of dried whitewash or plaster of Paris. In a poultry run, Stanwix, Carlisle.

Shepherd's Purse (***Capsella Bursa-pastoris*** DC.). White rust (*C. candidus* Lév.) at Cummersdale, Carlisle, Silloth, Keswick, and many localities not definitely recorded.

Sweet Violet (***Viola odorata*** L.). Subject to the same parasites as the next. In making the records, however, the species of violet has not been carefully recorded, hence the aggregate is given below.

Dog Violet (***Viola canina*** L.). (1) Clustercup (*Æ. violæ* Schum.), at Wetheral, Carlisle, Cockermouth, Deanscales, Eaglesfield, Monkhill, Dalston, Kendal, Bowness, and elsewhere.

(2) Rust (*Uredo violarum* DC.) at Cummersdale, Patterdale, and Cockermouth. (3) Brand (*Puccinia violæ* Schum.) at Wreay, Wetheral, Orton, Kendal, and Bowness. (4) Smut (*Urocystis violæ* Sow.) found at Cummersdale and Cotehill.

Campion, Red and White (***Lychnis dioica*** L.). The anthers are blackened by smut (*Ustilago violacea* Pers.). Recorded for Flimby, Silloth, Cockermouth, Eaglesfield, Furness Abbey, and elsewhere. The leaves infested with a brand (*Puccinia lychnidearum* Link.). My note-book says:—'Common, much liked by snails,' but, with the exception of Grinsdale and Wetheral, the records are not very exact.

Pearlwort (***Sagina procumbens*** L.) has once been found near Silverdale attacked by a brand (*Puccinia arenariæ* Sch.).

Wood Stitchwort (***Stellaria nemorum*** L.), which is abundant at Wetheral, is affected there by a brand which is probably identical with the foregoing (*P. arenariæ* Sch.), though Plowright and others have not mentioned this plant among their hosts. The life-history would make an interesting study, as there are numerous other plants growing in the locality on which the alternate generations might be found.

Stitchwort (***Stellaria Holostea*** L.) attacked by the Rust (*Melampsora cerastii* Pers.) at Grinsdale. I have found the same parasite on the mouse-ear at Longtown and Thornhill, north of our district.

Mallow (***Malva sylvestris*** L.) attacked by a Brand (*Puccinia malvacearum* Mont.), at Stanwix, Cotehill, Patterdale. A species of great interest, though only known in England since 1873. The cause of the failure among Hollyhocks.

NOTES on MOSSES.

***Pottia bryoides* near Louth.**—I took this moss on gravel drift at Welton-le-Wold, near Louth, on 5th May. As it is a new record for North Lincs. I send a note of it. Mr. M. B. Slater, F.L.S., who kindly identified it for me, tells me he finds it near Malton, Yorkshire, on similar formations, viz., the Oolitic Limestone gravel. Braithwaite, quoting it as a rare plant, gives localities for it in the South and Midlands.—J. LARDER, Louth, 10th May 1901.

***Bryum Davalii* at Adel, near Leeds.**—During April of 1899 I obtained a specimen of *Bryum* from Adel Bog which remained unnamed until last year. I then came to the conclusion that it was *B. Davalii* Voit. Dr. Braithwaite, to whom I sent a specimen, concurred, remarking that it was an unusually lowland station for this moss, which is usually an Alpine species. The only previous Yorkshire record was one by Mr. Binstead, for Howgill Fells. His record will therefore, I think, be the first for vice-county 64.—G. B. SAVERY, Pool, Leeds, 26th April 1901.

Naturalist,

NEW BRITISH DISCOMYCETES.

PART I.

GEORGE MASSEE, F.R.M.S., F.L.S.,
Royal Herbarium, Kew,
AND
CHARLES CROSSLAND, F.L.S.,
Halifax; Hon. Sec. Yorkshire Mycological Committee.

Although the primary object of this communication is to place on record those Discomycetes that have been added to the British Mycologic Flora since the publication of the latest work on the group,* the opportunity will be taken to summarise very briefly the leading features presented by this very beautiful family of fungi, and also of indicating the latest sources of information dealing with the subject, in the hope that some amongst the members of the Union who have not as yet taken up the study of any special group may be induced to turn their attention to the family under consideration.

The number of British species is sufficient to occupy the spare moments of any person for a lifetime. In 1836 Berkeley† described 144 species; in 1871 Cooke‡ described 293 species; in 1887 Phillips§ described 607 species; while in the latest book on the subject* 660 species are recorded. From the above statement it will be seen that, including the fungi indicated in the present contribution, over 60 species have been added to the British Flora during the last thirteen years, and amongst these many were new to science. It is further of interest to note that only eight persons have been concerned in the work of thus adding to our flora; and, finally, five of these persons are members of the Yorkshire Naturalists' Union; a sixth, now, alas! no more, was also a member of the Union. A glance at the results of the Union's annual fungus forays shows that the discovery of species new to Britain will, in all probability, yet continue to reward the patient investigator.

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* 'British Fungus-Flora,' Vol. IV. (1895), by Geo. Massee. Bell & Sons, London.

† 'English Flora,' W. J. Hooker, Vol. V., 'Fungi,' by M. J. Berkeley (1836).

‡ 'Handbook of British Fungi,' by M. C. Cooke (1871).

§ 'A Manual of the British Discomycetes,' by W. Phillips. Kegan Paul, Trench & Co. (1887).

The genus *Peziza,* which at one time included most of our Discomycetes, is at the present day more restricted, nevertheless yet includes some of the most beautiful and most generally known members of the group. The typical form of a *Peziza* is a cup- or saucer-shaped receptacle, or fruit-bearing portion, supported on a more or less elongated stem, and, in different species, varying in size from three or four inches across to minute structures not half a line broad (less than one-eighth). As would be expected in a large group, departures from a typical form are numerous; in some the edge of the cup is irregular or wavy, the margin and outside smooth, downy, or bristling with stout hairs, and in many the stem is entirely absent. Colour is equally variable, in many species being very bright and showy. All agree in having the spores or reproductive bodies produced in the interior of mother-cells or asci, each ascus usually containing eight spores. Much variety and beauty of structure is presented by the spores of different species, in form varying from globose, through elliptical, to spindle-shaped and needle-like; colourless, clear violet, brown, or blackish and opaque; while the surface of the spore may be smooth, warted, spiny, or covered with ridges uniting to form a beautiful network.

Finally, as to occurrence, the Peziæ are to be found practically everywhere and at all seasons. Many grow on the ground, more, perhaps, on dead wood, twigs, and leaves, several of the most beautiful and minute forms grow on dung of various animals, and not a few are well known as destructive parasites on the stems or leaves of living plants.

As to literature, we have two modern works dealing with the group, both are inexpensive, and both have illustrations of the various genera. The respective titles of the books are given in the preceding footnotes.

It only remains for us to thank our coadjutors—Mr. G. Nicholson, F.L.S., Curator of the Royal Gardens, Kew; Mr. E. S. Salmon, F.L.S., Kew; Mr. A. Clarke, Huddersfield; Mr. J. Needham, Hebden Bridge; and Mr. T. Gibbs, Sheffield—for their kind assistance. The late Mr. H. T. Soppitt, of Halifax, discovered several of the species enumerated here.

Cenangium sarothamni Fuckel, Symb. Myc., p. 270 (1870).

Erumpent, gregarious but usually isolated, less frequently in small clusters, up to 2 mm. across, sessile but narrowed below, externally and the erect, more or less wavy margin covered with clear lemon-yellow powder, below which the surface is brown; disc brown; asci cylindric-clavate, apex

narrowed, brown with iodine, 8-spored, 50-55 × 6-7 μ; spores 2-seriate, hyaline, continuous, smooth, elliptical, 6-8 × 3-3·5 μ; paraphyses filiform.

Entire substance of ascophore formed of interwoven hyphæ tinged yellow.

On dry branches of *Sarothamnus scoparius*, Scarborough, Yorks. N.E. (G. Massee).

The bright lemon-yellow primrose exterior is not mentioned by Fuckel; this, however, becomes washed away, leaving the surface brown or dingy.

Allied to *Cenangium leoninum* Cke. & Mass., which differs in the cæspitose, stipitate ascophores, and the minutely velvety exterior.

Boudiera Crosslandi Massee. ***Ascobolus* (*Sphæridiobolus*) *Crosslandi*** Boudier, Bull. Soc. Myc. France, XIV., pp. 126-7; 'The Naturalist,' January 1899, pp. 29-30, figs. 9-13.

On dog's dung, Halifax.

Boudier described the present species under the genus *Ascobolus*, where, on account of its globose spores, it cannot remain, but conforms in all essentials with the genus *Boudiera*, characterised as follows:—*Boudiera* Cooke, Grev. VI., 76 (1877). Ascophore fleshy, orbicular, asci at maturity exserted; spores globose, coloured; paraphyses present.

Distinguished by the globose, coloured spores.

Ascobolus stictoideus Speg., Mich. I., p. 474; Crossl., 'The Naturalist,' January 1900, p. 8.

Scattered, almost immersed, margin only free, ¼-⅓ mm. across; disc brownish, dotted with the protruding asci at maturity; asci few, broadly clavate, operculate, base stout, 150-190 × 40-45 μ, 8-spored; spores irregularly biseriate at first, becoming aggregated at the apex of the ascus when mature; elliptical, hyaline, then lilac-purple, finally tinged brown, the epispore breaking up into areolæ, 28-30 × 14 μ; paraphyses hyaline, simple or branched, 4 μ thick, apex scarcely thickened and very slightly curved.

On dog's dung, Halifax.

The ascophores are almost entirely immersed in the matrix, very little more than the margin and disc being visible. The mature projecting asci are very conspicuous before the ejection of the spores. Compared with a specimen from Spegazzini in the Kew Herbarium.

Ascobolus minutus Boud., Bull. Soc. Myc. IV., tab. xi., f. 1; Sacc., Syll. VIII. n. 2146; Crossl., 'The Naturalist,' Jan. 1900, p. 8.

Gregarious or scattered, very minute, ⅓-½ mm. across, brown; externally paler, even, glabrous, tawny, immarginate; disc plane or convex, at length rough with the slightly protruding asci; asci clavate, octosporous, 140-170 × 13-14 μ; spores elliptical, violet, at length fuscous, longitudinally striate, striæ scarcely anastomosing 13-15 × 7-9 μ; paraphyses hyaline, septate, 5-7 μ thick at the thickened apex, immersed in yellow gluten.

Hab.—On dogs' dung, Hebden Bridge, J. Needham.

The spores of this species are amongst the smallest met with in the genus *Ascobolus*; in Boudier's specimens they measured 13-15 × 7·9 μ, in ours 11-14 × 6·5-7·5 μ. The asci are comparatively slender for that genus, 140-170 × 13-14 μ Boudier, ours 140-160 × 12-13 μ; as a consequence the spores remain uniseriate until ejected, which is unusual in *Ascobolus*.

The cortical cells are horizontally elongated, elliptical, 16-24 × 12-16 μ.

Ascobolus Leveillei Boud., Ascob., p. 35, tab. vii., f. 16; Sacc., Syll. VIII., n. 2153; Sopp. and Crossl., 'The Naturalist,' January 1899, p. 29.

On horse dung, Copley, near Halifax.

Saccobolus granulospermus Sopp. & Crossl., 'The Naturalist,' January 1899, pp. 30-1, figs. 14-16.

On cow dung, Harewood, near Leeds, Y.N.U. Fungus Foray.

Mollisia nervicola (Desm.) Gill., Disc., p. 128; Sacc., Syll. VIII., n. 1368; *Peziza nervicola* Desm., 8, Not., p. 5.

Ascophores sessile, fleshy soft, subglobose then expanded, disc plane, margin raised ½-1 mm. across, exterior glabrous or minutely papillose, grey-brown below, shading off to pale cinereous at the margin, disc dark watery cinerous; asci cylindric-clavate, 40-50 × 5 μ, apex narrowed and rounded; spores eight, obliquely biseriate, elliptic-fusiform, or approaching clavate, 8-10 × 2 μ.

Hab.—On under surface of decaying oak leaves; mostly on the nerves. Hebden Bridge, J. Needham.

Mollisia betulicola Rehm. Kr. Fl., Disc., p. 538; Crossl., 'The Naturalist,' January 1900, p. 7.

Gregarious or crowded on pale spots, closed and globose at first, then becoming plane with a delicate border, up to 0·5 mm.

across; disc pale reddish-white, outside smooth, yellowish or brownish; asci cylindric-clavate, apex slightly narrowed, plug blue with iodine, 50-60 × 9-10 μ; spores 8, irregularly 2-seriate, narrowly elliptical, ends obtuse, straight, hyaline, continuous, 9-12 × 3 μ; paraphyses filiform, cortical cells subcircular, tinged brown, becoming smaller towards the margin, where they run out into rows of short, parallel cells.

On fallen decaying birch leaves, Hebden Bridge (J. Needham).

Although the asci and spores in our specimens are rather smaller than in Rehm's, there is no doubt as to the identity of the species. Rehm's asci are 50-60 × 9-10 μ, and spores 9-12 × 3 μ. Saccardo gives them as 56 × 8 μ and 8-10 × 3 μ respectively. In the Hebden Bridge specimens the asci are 40-45 × 6-7 μ, spores 8-10 × 2·5 μ, occasionally approaching 3 μ.

Mollisia pteridina Karst., Myc. Fenn. I., p. 194; Sacc., Syll. VIII., n. 1446; Sopp. and Crossl., 'The Naturalist,' January 1899, pp. 28-29, f. 18-21.

On decaying fern stipes, High Greenwood, Heptonstall, near Halifax.

In the British specimens the exterior of the ascophore is minutely reticulated with black ridges.

Belonidium Clarkei Mass. & Crossl. (sp. nov.). Figs. 1-6, Pl. 1.

Gregarious, sessile on a broad base, pulvinate or convex, margin not in the least raised, pale yellowish-green, soft, up to 1 mm. across; asci clavate, apex rounded, not blue with iodine, 90 × 8 μ; spores 8, 2-seriate, hyaline, narrowly elliptical, 4-guttulate, then 3-septate, slightly constricted at the septa, 12 × 3 μ; paraphyses filiform, tips not thickened; cortex parenchymatous, cells 8-12 μ diameter.

On damp, rotten wood, Mulgrave Woods, Whitby, Y.N.U. Foray, September 1900 (A. Clarke, Huddersfield).

A very pretty and distinct species, allied to *Belonidium ventosum* Phil., but distinguished by the pulvinate, immarginate, green ascophore and the smaller spores.

Belonium pilosum Crossl. 'The Naturalist,' January 1900, pp. 9-10, figs. 4-14.

On old stems and leaves of *Carex pendula,* Elland, near Halifax.

Diplocarpa Curreyana Massee.

Syn. *Encœlia Bloxami* Phil., Brit. Disc., p. 338.

Cenangium Bloxami Sacc., Syll. VIII., No. 2343; Massee, Brit. Fung. Flora, IV., p. 114.

The discovery of this rare fungus by Mr. Gibbs, in Mulgrave Woods, during the Yorks. Nat. Union Foray, September 1900, enables us to give a revised diagnosis of the species.

An opportunity of examining the fungus described by Phillips —Brit. Disc., p. 338—as *Encœlia Bloxami* Phil., shows this species to be identical with *D. Curreyana.*

The spores prove to be permanently continuous, hence the generic diagnosis of *Diplocarpa,* as given in Brit. Fung. Flora, IV., p. 307, must be emended by the substitution of 'spores continuous' in place of 'spores finally 3-septate.' Small 3-septate conidia had probably been mistaken for free ascospores when drawing up the generic diagnosis from herbarium material.

The following is the emended specific diagnosis of *D. Curreyana* :—Gregarious, globoso-depressed and closed at first, gradually expanding until the disc is plane, up to 1 cm. across; margin slightly raised, pilose, hairs reddish-brown, 100-150 × 5-7 μ; disc dingy olive-green; externally dusky purple-brown, warted, narrowing downwards into a stem-like base; asci cylindric-clavate, about 60 × 6 μ; spores 8, 1-seriate, hyaline, continuous, elliptical, ends rather narrowed, 2-guttulate, 6-8 × 3-3·5 μ; paraphyses filiform. Mixed with the paraphyses and of equal length are numerous slender threads, each bearing a conidium at its apex; the conidia are first hyaline, then slightly tinged brown, 1-3-5-septate, fusiform, 20-40 × 5-6 μ. Cortex parenchymatous, coloured.

On wet, rotten wood. The entire plant is subcartilaginous, and dusky purple-brown throughout. The numerous conidia stand at a higher level in the hymenium than the tips of the asci. When sown in a suitable nutritive medium the conidia germinate readily.

Lachnea contorta Mass.&Crossl. (sp. nov.) Pl. 1, figs. 7-11.

Ascophores crowded and irregular in form, due to lateral pressure, closed when young, gradually becoming plane, but with a persistent erect margin, disc vermilion, externally paler, up to 1 cm. across; spines almost hyaline or tinged yellow, slightly tapering, apex obtuse, multiseptate, longest at the margin, where they average 300 × 12 μ, wall thin; hypothecium and excipulum formed of interwoven hyphæ, passing into a large-celled parenchymatous cortex; asci cylindrical, apex obtuse, 8-spored, 300 × 14-15 μ; spores elliptical, ends obtuse, smooth, hyaline, 23-25 × 12 μ, eguttulate; paraphyses slender, apex rather abruptly subglobose, red.

On naked ground, Selby, Mid West Yorkshire (G. Massee).

Readily distinguished among the red species of *Lachnea* by the almost cylindrical and nearly colourless multiseptate, thin-walled marginal hairs and the large spores. Most nearly allied to *L. umbrata* Phill., which differs in having much smaller spores and less crowded habit of growth.

Lachnea Lojkæana Rehm, Kr. Fl. Disc., p. 1045.

Scattered, sessile, at first globose and closed, finally almost plane with an upraised margin, 3-5 mm. across; disc dingy yellowish-brown, sometimes with a flesh-coloured tinge; externally furnished with pointed, pale yellow-brown septate hairs 100-150 × 6-8 μ; asci cylindrical, apex obtuse; 8-spored, 180-200 × 12-14 μ; spores obliquely 1-seriate, broadly elliptical, smooth, hyaline, eguttulate, averaging 16 × 9 μ, paraphyses slender, scarcely thickened at the pale-coloured tips; cortex parenchymatous, cells 15-18 μ diam., brownish.

Syn. *Peziza luteopallens* Cke., Mycogr., fig. 156.

Neottiella luteopallens Sacc., Syll. VIII., p. 191.

On the ground, Hebden Bridge, Yorkshire.

Allied to *L. cretea* in general structure and in the thin-walled hairs, but differing in colour and other features.

Dasyscypha inquilina Winter, in Fung. Eur. Exs., n. 2841.

Scattered, sessile or narrowed to a stem-like base, subglobose at first, then expanded, disc slightly concave, margin raised, 1 mm. across, white, externally shortly pilose, hairs delicate, hyaline, septate, 40-50 × 4-5 μ, apex rounded or subclavate, scattered or tufted; asci cylindric-clavate, apex narrowed, 35-40 × 5 μ; spores 8, obliquely subbiseriate, hyaline, continuous, eguttulate, narrowly oblong-fusiform, straight, 6-9 × 1·5-2 μ; paraphyses narrowly lanceolate, rather longer than the asci, 40-50 × 2·5-3 μ at broadest part; flesh white, very thin; hypothecium of densely interlaced hyaline hyphæ 3-4 μ thick; cortical cells 10-16 × 4-5 μ below, shorter and broader above, narrowing towards the margin.

On *Equisetum sylvaticum*, Hebden Bridge, J. Needham.

The above diagnosis is drawn up from the British specimens. The ascophores are a little larger than in Continental specimens.

Dasyscypha vitreola Massee. Pl. 2, figs. 12-16.

Gregarious, sessile, concave, becoming almost plane, substance very thin, watery, translucent, white, becoming more or less tinged with yellow when dry, up to 0·5 mm. across; margin and for a short distance down the outside minutely pilose, marginal hairs largest, 30-40 × 3 μ; cortex minutely parenchy-

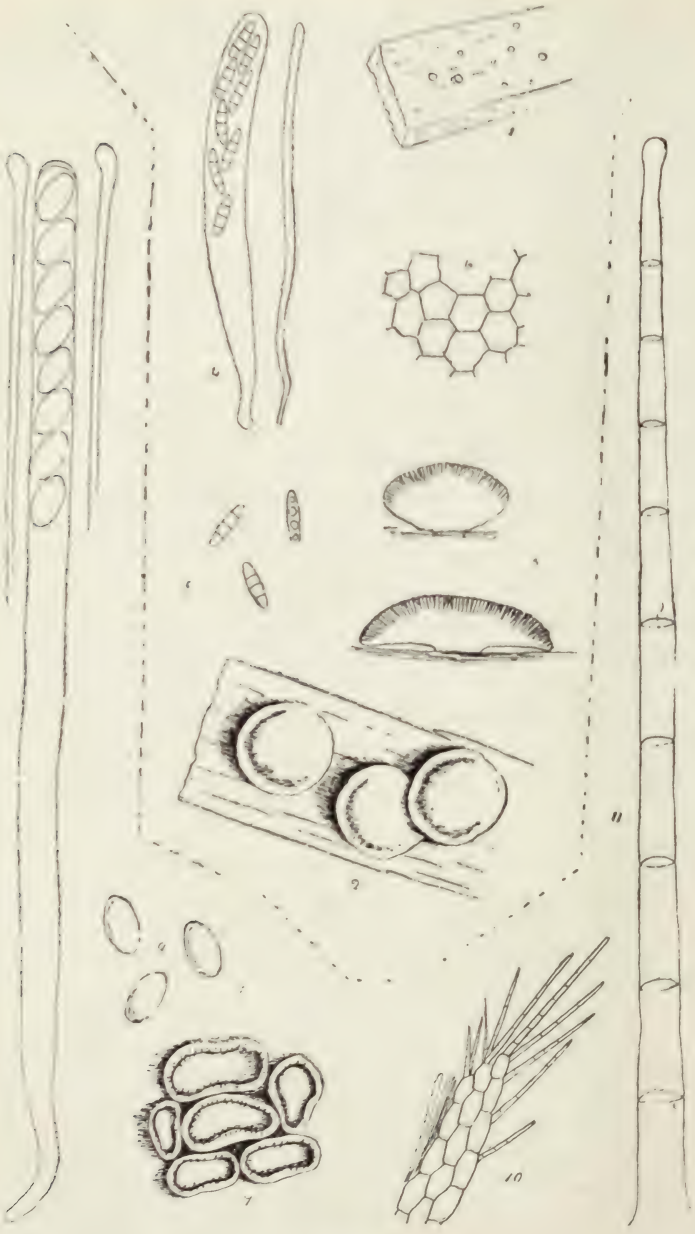

PLATE 1.

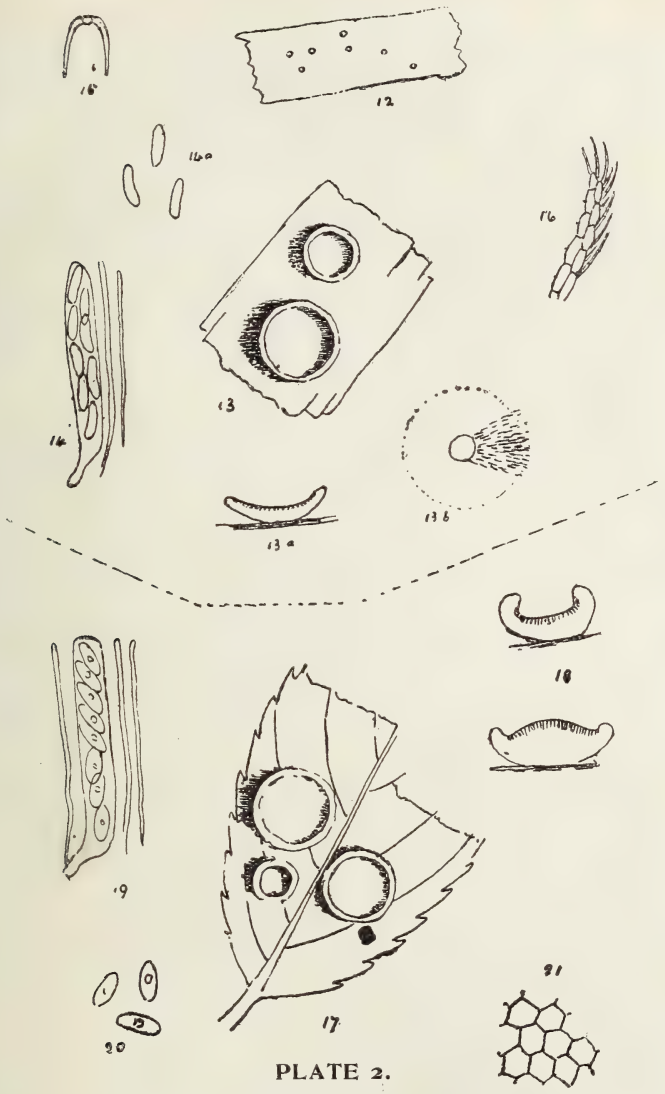

PLATE 2.

EXPLANATION OF FIGURES.

PLATE 1.—Figs. 1-6, *Belonidium Clarkei* Mass. & Crossl.; 1, ascophores natural size; 2, enlarged 10 diams.; 3, sections × 20-24 diams.; 4, ascus, spores, and paraphyses × 450; 6, cortical cells × 400. Figs. 7-11, *Lachnea contorta* Mass. & Crossl.; 7, ascophores natural size; 8, ascus and paraphyses × 400; 9, spores × 400; 10, cortical cells and hairs × 24; 11, hair highly magnified.

PLATE 2.—Figs. 12-16, *Dasyscypha vitreola* (Karst.) Mass.; 12, ascophores natural size; 13, do. enlarged 20 diams.; 13a, section × 20; 13b, exterior × 25; 14, ascus and paraphyses ×400; 14a, spores × 400; 15, apex of ascus × 700; 16, cortical cells and hairs × 40. Figs. 17-21, *Humaria Nicholsonii* Mass. & Crossl.; 17, ascophores on leaf natural size; 18, sections × 2; 19, ascus and paraphyses × 400; 20, spores × 400; 21, cortical cells × 400.

matous; asci cylindric-clavate, about 60 × 7-8 μ, 8-spored, plug blue with iodine; spores 2-seriate, cylindrical or cylindric-fusoid, usually very slightly curved, hyaline, continuous, 2-4-guttulate, 11-14 × 3·5-4 μ; paraphyses slender, cylindrical.

Syn. *Peziza* (*Helotium*) *vitreolum* Karsten, Myc. Fenn. I., p. 145 (1871).

Pseudohelotium vitreolum Sacc., Syll. VIII., n. 1217 (1889).

On dead blackberry stems; Queen's Cottage Grounds, Kew Gardens (G. Nicholson).

Allied to *Dasyscypha hyalina*, but readily distinguished by the larger spores. Karsten's specific name is very apt, as when quite fresh the cups present the appearance of being made of glass, and are almost transparent.

Dasyscypha Richonii (Boud.) Massee.

Gregarious, entirely rose-pink or with the disc darker and dingy, sessile, closed at first, then expanding until almost plane, rather fleshy, about ⅓ mm. across; hairs at the margin thin-walled, acute, septate, tinged rose-colour, 50-120 × 3-4 μ, those on the outside of the ascophore smaller; asci subcylindrical, apex slightly narrowed, 8-spored, 40-45 × 5-6 μ; spores hyaline, continuous, elliptical, minutely 2-guttulate, 6-7 × 2-2·5 μ; paraphyses filiform, tips not thickened; cortex parenchymatous, cells small, elongated in the direction from base to margin.

Syn. *Urceolella Richonis* Boud., Soc. Myc. France, IV., p. 82, pl. 17, f. 3 (1889).

Trichopeziza Richonii Sacc., Syll. VIII., No. 1711 (1889).

On rotten wood, Mulgrave Woods, Whitby; Y.N.U. Foray, September 1900 (J. Needham).

This beautiful little fungus has only, previous to its discovery near Whitby, been recorded from France, where it was found growing on rotten poplar wood. Readily distinguished by its rosy colour. The wood on which it is growing is also tinged pink when the fungus is developed in abundance, and more or less crowded.

Dasyscypha citricolor B. & Br.

Gregarious, sessile, base slightly narrowed, finely tomentose, marginal hairs best developed, 40-50 × 2·5-3 μ, citron yellow, or with just a tinge of green, up to 0·5 mm. across; asci subcylindrical, 80-90 × 10 μ, apex thickened, plug blue with iodine, 8-spored; spores cylindrical, ends rather pointed, 2-4-guttulate, 17-21 × 4-4·5 μ; paraphyses filiform, sometimes branched.

On a rotten twig, Langdale End, Scarborough, Yorks. N.E. (C. Crossland).

Readily distinguished by the yellowish-green colour of the ascophore. Has a superficial resemblance to *Mollisia mali* Phill. No specimen of this species exists in the Berkeley Herbarium at Kew, hence the diagnosis given in Brit. Fungus-Flora, IV., p. 356, was incomplete.

Geopyxis albida (Gill.) Mass.

Syn. *Aleuria albida* Gillet, Discom. France, p. 36, cum icone; Crossl., 'The Naturalist,' January 1900, p. 7.

Acetabula albida Sacc., Syll. VIII., n. 194.

Warehouse yard, Halifax.

Barlæa modesta Sacc., Syll. VIII., n. 426; Sopp. and Crossl., 'The Naturalist,' January 1899, p. 27.

Gregarious or scattered, sessile, soft, fleshy, subglobose at first, becoming plane, 2-3 mm. across, clear orange-red; asci cylindrical, apex obtuse, 250-300 × 23-26 μ, 8-spored; spores 1-seriate, hyaline, globose, smooth at first, then covered with slender spines about 3 μ long; paraphyses septate, apex clavate, 7-8 μ thick, containing orange globules; excipulum and cortex formed of large subglobose cells.

Among Hepatics, on sandy ground, Luddenden Dean, near Halifax, T. W. Woodhead.

Distinguished among British species by its large size, clear colour, and spinulose spores.

Barlæa Persoonii Sacc., Syll. VIII., n. 438; Crossl., 'The Naturalist,' January 1900, p. 9.

Syn. *Ascobolus Persoonii* Crouan, Flor. Finist., p. 56.

Barlæa violascens Massee, Brit. Fung. Flora, IV., p. 398.

Mossy ground, Hebden Bridge.

Humaria carneola Winter, Hedw., XX., p. 130; Salmon, Quekett Micr. Journ. VII., 372, pl. 20, figs. 4-7.

Growing on living moss—*Tetraplodon mnioides* B. & S.—on a mountain called Quinag, near Inchnudamph, Sutherlandshire, Scotland.

A beautiful little discomycete; spores minutely warted, usually only four in an ascus.

Humaria rubens Boud., Bull. Soc. Myc. France, 1896, p. 13, Tab. 3, f. 1. Sopp. and Crossl., 'The Naturalist,' January 1899, p. 27.

Growing among moss, Nut Clough and Crimsworth Dean, both near Hebden Bridge.

1901 June 1.

Humaria Roumegueri Sacc.

On peaty ground in an old quarry, Crimple, near Harrogate, Yorkshire (L. J. Cocks).

Although not recorded for Britain at the time, a diagnosis of this species is given in 'British Fungus Flora,' IV., p. 413, on the assumption that it would probably be discovered, as its var. *carnosissima* Phill. is British.

Humaria Nicholsonii Massee (sp. nov.). Pl. 2, figs. 17-21.

Gregarious, sessile, fleshy, globose at first, gradually becoming plane, or sometimes slightly convex, marginate, glabrous, 4-7 mm. across, orange-yellow, cortex parenchymatous, cells averaging 6-7 μ diameter; asci cylindrical, 8-spored, 65-70 × 8-9 μ; spores elliptical, smooth, hyaline, ends obtuse, 1-guttulate, 10 × 6 μ; paraphyses filiform, apex not thickened.

On dead beech leaves, Kew Gardens (G. Nicholson).

Well defined by the small asci and spores, and the small cells of the cortex. Not very near to any other known species.

Humaria leporum Cooke, Mycogr., fig. 75.

This name must be substituted for that of *Humaria misturæ* (Phill.), Brit. Discom., p. 100; Massee, Brit. Fung. Fl. IV., p. 423.

Humaria fimeti Symb. Myc., App. I., p. 50.

This name must replace that of *Humaria bovina* (Phill.). Brit. Disc., p. 101; Massee, Brit. Fungus-Flora, IV., p. 423.

Humaria deerata Sacc., Syll. VIII., no. 550; Sopp. & Crossl., 'The Naturalist,' January 1889, p. 28, figs. 1-8.

This species is certainly not a good *Humaria*, neither does it agree with any established genus. Boudier has suggested the generic name *Pseudombrophila* for the reception of this species, but no workable diagnosis is given.

Humaria Oocardii (Kalch.) Sacc., Syl. VIII., n. 571; Rehm. Disc., p. 954; Mass. Brit. Fung. Flo., Vol. IV., p. 422.

Syn. *Peltidium Oocardii* Kalch., Rabh. Fung. Europ., n. 521.

Peziza (*Humaria*) *Oocardii* Cooke, Mycogr., p. 28, fig. 47; Phill., Brit. Disc., p. 68.

Revised diagnosis made from freshly gathered British specimens.

Ascophores gregarious or scattered, sessile, pulvinate from the first, ¾-1 cm. across, 2-2·5 mm. thick, emarginate, disc red-brown, exterior pale ochrey-brown; excipulum translucent, gelatinous, whitish, composed of laxly interwoven, branched, curled hyphæ, 7-9 μ thick, which suddenly give place at the

cortex to perfectly globular cells 40-60 μ diam. forming a cortical layer 2-3 cells deep; asci cylindrical, 350-390 × 16-20 μ, apex rounded-truncate, foot narrowed and curved; spores 8, obliquely 1-seriate, hyaline, broadly elliptical, smooth, constantly 2-guttulate, continuous, 19-21 × 12-13 μ, guttæ 7-8 μ diam.; paraphyses slender below, gradually becoming clavate at apex, where they are 7-8 μ thick, 1-3 septate, brown above, hyaline below.

Hab.—On dead thorn wood in running water, in several places about Halifax. On larch cones in swamp, Hebden Bridge, J. Needham, 1899. On branch laid in stream, Mulgrave Woods, Whitby, Y. N. U. Fungus Foray, September 1900. Apparently a semi-aquatic species.

The ascophores collapse and become quite flat and blackish when dry. When fresh a reddish line marks the boundary of the hymenium. The rounded apices of the asci become a little depressed in the centre prior to the expulsion of the spores, after this has taken place the torn edges of the aperture stand erect, or are slightly reflexed. No trace of a septum has yet been found by us in any of the spores.

The gelatinous nature of the ascophore scarcely warrants this species being placed in the genus *Humaria*. Kalchbrunner formed a new genus, *Peltidium*, for its reception.

Mitrophora rimosipes Lév., Ann. Sci. Nat., Ser. iii., Vol. V. (1846), p. 250.

Ascophore obtusely conical or sometimes almost subglobose, lower margin quite free from the stem for some distance, ribs prominent, anastomosing to form irregularly polygonal pits, dingy ochraceous with an olive tinge, 1-2 cm. high and nearly as much across the base; stem 5-10 cm. long, 1·5-2 cm. thick, generally thickest downwards, hollow, wall thin, subdiaphanous, externally whitish, and coarsely longitudinally grooved or striate, the interstices of the cracks farinose, as is also the inside of the stem; asci cylindrical, apex rounded, about 300 × 16-18 μ; spores 8, obliquely 1-seriate, elliptical, ends obtuse, 20-25 × 12-15 μ; paraphyses cylindrical, apex clavate, colourless.

Syn. *Morchella rimosipes* DC., Flor. France, II. (1805), p. 214; Sac., Syll. VIII. (1889), n. 22.

On the ground, Edith Weston, Rutland, May 1899 (Miss Crowther-Baynon).

Allied to *Mitrophora semilibera* Lév., but recognised by the larger spores, and more especially by the conspicuous grooves or cracks in the substance of the upper part of the stem.

NOTES on COLEOPTERA.

***Adimonia tanaceti* near Louth, Lincolnshire.**—A few days ago Mr. C. S. Carter took three specimens of *Adimonia tanaceti* at Redhill, in the parish of Goulceby. It has hitherto been supposed that the range of this beetle in this district was confined to a meadow, known as the Greasy-field, adjoining Maltby Wood.—R. W. GOULDING, Louth, 6th Nov. 1900.

***Alianta incana* in Yorkshire: An Addition to the List of Yorkshire Coleoptera.**—When the Yorkshire Naturalists' Union visited Askham Bog, York, on 4th June 1900, I took an *Alianta* from the stems of reeds in that rich locality. A short time ago, Mr. E. A. Newbery, of London, kindly examined this insect and pronounced it *Alianta* (*Homalota*) *incana* Er. According to Fowler (British Coleoptera, Vol. 2, p. 64) this local species had not been previously found in the North of England.

A second Yorkshire locality must also be added, as *A. incana* is contained in a MS. list of Beetles met with in the neighbourhood of Scarborough by the late Robert Lawson, and at present in my hands.—M. LAWSON THOMPSON, 35, Leven Street, Saltburn-by-the-Sea, 17th April 1901.

NOTES on MAMMALIA.

Albino Hare near Horncastle.—A white Hare (*Lepus europæus*) with pink eyes has been recently shot in Fulsby Wood, by the keeper of Sir H. M. Hawley, of Tumby Lawn, near Horncastle. J. CONWAY WALTER, Langton Rectory, Horncastle, 16th October 1900.

Seal in the Tees.—A Seal (*Phoca vitulina*) was shot in the River Tees on the 28th January. It measured 3 feet 9 inches in length, and was said to weigh about 8 stones. The colour was silvery grey, with a few black spots on the back.—R. LOFTHOUSE, The Croft, Linthorpe, Middlesbrough, 26th February 1901.

Badger in County Durham.—In the month of August, a year or two ago, a young Badger (*Meles meles*) was caught in a young fir plantation, called the Black Banks, in the Browney Valley, between the hamlets of East and West Butsfield and the village of Satley, in the county of Durham. The animal was caught alive, unhurt, and was afterwards sold by the person who captured it.—J. W. FAWCETT, Satley, Darlington, 22nd March 1901.

The Squirrels of Roundhay Park, Leeds.—It can hardly be the custom, rather the exception proving the rule negative, for this feral Punchinello (*Sciurus vulgaris*) to hiemate, I fancy; as I had the pleasure of glimpsing two in the big beeches adjacent to the fish-hatchery and upper lake very recently; and late in November, walking with a young cousin, in 'the Gorge' we saw one on the path ahead skipping to cover in a leisurely, comical, catch-me-if-you-can sort of way. Is this explained by the unusually open season? The beech-mast in the Park does not ripen its prism-fruit most years.—F. A. LEES, Roundhay Road, Leeds, 14th February 1901.

North-West Lindsey Mammalia Notes.—The late David Hopkins, who farmed Howsham Barf from 1845 to 1870, was a naturalist in a simple way, and loved the birds and beasts to be found on or around his holding. He left the following stuffed specimens behind him; they are now in the possession of his daughters at Brigg, having been moved just a year ago from this parish:—

A Badger (*Meles meles*) from Searby, close by. One has been killed on the railway line in this parish since his time, and is now in the possession of Mr. John Sanderson, of Howsham.

A Squirrel (*Sciurus vulgaris*) killed by a sharp cut of his whip as it was running up a tree. A Stoat (*Putorius ermineus*).

As these specimens have been removed from this parish it is as well to put them on record.—E. ADRIAN WOODRUFFE-PEACOCK, Cadney, Brigg, 15th May 1900.

NOTES on BIRDS.

Abundance of Nightingales near Doncaster.—I have never known Nightingales (*Daulias luscinia*) to be more abundant here than they are this spring. I first heard one at Edlington, 21st April 1901, and since then they have come in numbers. Usually one notes isolated spots where the Nightingale may be heard and makes special journeys to hear him, but this year wherever one goes the song is heard.—H. H. CORBETT, Doncaster, 6th May 1901.

Unusual Nidification of Wren at Silverdale, West Lancs.—I found the nest of a Wren (*Troglodytes troglodytes*) in a crevice of a rocky cave on the shore at Silverdale, on the 11th inst., which contained six eggs. The rock was absolutely bare of vegetation, and there was not the slightest attempt at concealment. The withered stems and leaves of *Sesleria cærulea* entered largely into the composition of the outer frame of the nest, interwoven with a little moss.—J. A. WHELDON, Liverpool, 14th May 1901.

Arrivals of Migrants near Spurn.—I first heard the Cuckoo (*Cuculus canorus*) here on 19th April; an odd Swallow (*Hirundo rustica*) the same day. A few more Swallows about yesterday, the 12th of May; only a very few about to-day, the 13th inst. A pair of House Martins (*Chelidon urbica*) about here on the 8th of May; a few Pied Wagtails (*Motacilla lugubris*) same day. A Pied Flycatcher (*Muscicapa atricapilla*) in garden here on the 10th inst. A male Pied Flycatcher found dead here on the 20th of April; it had died for want of food, the weather being very cold and wet at that time.—PHILIP W. LOTEN, Easington, near Spurn, 13th May 1901.

Virginian Nightingale on the Yorkshire Wolds.—I was travelling with a gentleman on the 17th July near Filey, on the railway, when he told me he had lately got a specimen of this American bird, which he had had stuffed at Filey. It was shot on the East Riding Wolds, I think near Hunmanby. There were two of these migrants, but the other one escaped. The taxidermist who set it up informed me that the specimen was not a caged one, but apparently wild and healthy.

It is, I believe, the fact that these American migrants are usually seen on, or near, the *east* coast of England, arriving here, in all probability, by Iceland, the Faroe Islands, Norway, and so as it were back again to England. Herr Gätke does not mention in his work on Heligoland that this species has been observed in that well-known 'Ornithological Observatory.'—B. B. HAWORTH-BOOTH, Hullbank Hall, Hull, 9th Aug. 1900.

Variety of the Coal Tit at Gainsborough.—A strange-looking Tit came frequently, during the winter of 1899 and 1900, for outdoor-relief to the bones hanging near my dining-room window, and for some time I was puzzled to make it out. It resembled the Coal Tit (*Parus ater*) but, instead of the usual small white patch at the back of the head, a straight, narrow, grey-white band extended up from the nape to about the middle of the head.

On the 7th of February this year the bird appeared again, and this time, strange to say, accompanied by another like it. For some time it was difficult to make out whether there were really two, or whether one, feeding on the bone, returned quickly after leaving it—as birds often will do. Several members of my household affirmed they had seen two together, and, at last, I got a view myself of both feeding at the same time, which settled the question.

That a similar variation should appear in two birds at the same time is extraordinary, and I can only suppose that the variation in question is not a mere chance sport, but one which, if not common, is a known character with the Coal Tit; and this supposition is borne out by my having seen another (unnamed), like these two, in the museum of the Rev. Walter Earle's school, at Bilton Grange, near Rugby. This, to me at all events, seems the only explanation of the occurrence, and I hope some of your readers will throw further light on the matter.—F. M. BURTON, Highfield, Gainsborough, 3rd May 1901.

NOTE on LEPIDOPTERA.

Abundance of *Vanessa io* at Silverdale, West Lancs.—On the 11th inst. I was botanising on the Scar Limestone at Silverdale, West Lancashire, and was much pleased to find many butterflies on the wing which are decidedly scarce about Liverpool. *Vanessa io* was especially abundant and in fine condition; also *Anthocharis cardamines, Gonepteryx rhamni,* and *Pieris brassicæ.*—J. A. WHELDON, Liverpool, 14th May 1901.

NOTE on WORMS.

'Leech' near Louth: its Habits, etc.—In the spring of this year I brought home, amongst other creatures, a small 'Leech' about ⅜ in. long, white, semi-transparent, the alimentary canal red (which colour disappeared after a short period of captivity); it had apparently eight 'eyes.' I kept it in a small glass globe. Noticing it one day somewhat swollen, I took it out and discovered a cluster of 'eggs' of a greenish white colour, globular in form, attached in some way to the underside of the animal. On 1st July I discovered these 'eggs' had 'hatched,' and were being brooded. I separated them, 21 in number, placing them in the globe again one at a time, also the adult. Four days after I took it out again, and I found them collected together as before.—C. S. CARTER, Louth, 17th September 1900.

NOTES on FLOWERING PLANTS.

Toothwort near Louth. — On 1st May I found the Toothwort (*Lathræa squamaria*) in Grisel Bottom, Burwell Wood. It was exhibited at the meeting of the Louth Antiquarian and Naturalists' Society last night, when I was informed by Mr. Crow and Mr. Larder that it had not been found in the district before, and is at their request recorded.—C. S. CARTER, 172, Eastgate, Louth, 10th May 1901.

Aberration of Wild Hyacinth near Doncaster.—On 2nd May I gathered in Edlington Wood a specimen of *Scilla festalis* Salisb., which, for want of another name, may be called var. *longibracteata.* The bracts, which in normal examples are about half the length of the pedicle and flower combined, are in this form greatly developed, the lowest being 5 in. in length and all exceeding the flowers. Moreover, they are not of the blue colour such as they are in normal specimens, but are of a bright green, similar to the green of the leaves.—H. H. CORBETT, Doncaster, 6th May 1901.

Dates of Leafing of Horse Chestnut and Blossoming of Cherry at Wetwang-on-the-Wolds, 1879-1901.—I beg to forward the following notes, taken by me at Wetwang-on-the-Wolds for a series of years. The same two trees were selected every year.

Date.	Horse Chestnut. First Green Leaf.	Cherry Blossom. First Full Blossom.	Date.	Horse Chestnut. First Green Leaf.	Cherry Blossom. First Full Blossom.
1879	April 26	—	1891	May 3	May 8
1880	—	—	1892	April 23	May 3
1881	—	May 10	1893	—	April 11
1882	April 7	April 9	1894	April 10	April 13
1883	—	—	1895	April 20	—
1884	April 10	April 10	1896	—	April 19
1885	—	April 28	1897	—	April 22
1886	April 25	May 5	1898	April 23	April 24
1887	—	—	1899	April 24	April 29
1888	May 1	May 8	1900	April 20	May 2
1889	April 28	May 5	1901	April 20	April 27
1890	April 19	April 22			

—E. MAULE COLE, Wetwang, 3rd May 1901.

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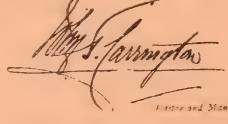

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Flora of West Lancashire: Silverdale Area.—I have tried to buy and I have tried to borrow the undermentioned issues without success. Will someone (if unable or unwilling to lend) extract for me the West Lancashire items relating to Silverdale? A list has been on the stocks for some years and only waiting for this information to complete the bibliography. Watson Bot. Exch. Club, Nos. 1, 2, 4, 5, 7, 8, 10, 12 to date; Rep. Bot. Exch. Club, 1867 and earlier, 1869, 1877-8-9, 1881, 1890, 1896 to date.—S. L. PETTY, Ulverston.

LINCOLNSHIRE PSEUDOSCORPIONS: WITH AN ACCOUNT OF THE ASSOCIATION OF SUCH ANIMALS WITH OTHER ARTHROPODS.

H. WALLIS KEW, F.Z.S.,
London; formerly of Louth, Lincolnshire.

At the time of the publication of the Rev. O. Pickard-Cambridge's memoir 'On the British Species of False-Scorpions,' in 1892, about 46 kinds were known in Europe, of which 20 had occurred in Britain, and no less than 14 in the single county of Dorset.* Several species are stated to be common and widely distributed, but they are seldom seen unless specially looked for, and thus it happens that for Lincolnshire, where no one has particularly attended to these creatures, we are as yet able to record four species only. Personally, while collecting in the county for several years, I found but one species, the *Chelifer latreillii* Leach; and during these later years, in what Londoners are pleased to call the home-counties, I have encountered but one other, the *Obisium muscorum* Leach, which occurred among dead leaves in Epping Forest.

The Lincolnshire species, though as yet only four, represent as many genera: *Chthonius, Chelifer, Chernes,* and *Chiridium*; and they leave unrepresented, of British genera, two only, *Roncus* and *Obisium*. They have been very obligingly identified, from *all* the Lincolnshire localities under-noted, by Mr. Cambridge, whose kindness I desire to acknowledge with much gratitude. In preparing the second part of the paper, I have had the good fortune to enjoy the co-operation of Mr. G. K. Gude, who in this as in other tasks has helped me with the literature. My thanks are due, moreover, to Mr. Beaulah, of Raventhorpe; Dr. George, of Kirton-in-Lindsey; Mr. J. E. Mason, of Lincoln; Mr. Carter, Mr. Goulding, and Mr. Larder, of Louth, who have contributed local notes and specimens; and also to Mr. F. M. Campbell, of Machynlleth; Dr. W. Hess, of Mulhouse (Alsace); Dr. F. v. Wagner, of Giessen; the Rev. A. Thornley, of South Leverton; and Lt.-Col. H. J. O. Walker, of Budleigh Salterton, who have favoured me with replies to inquiries and with references.

* O. P.-Cambridge, 'On the British Species of False-Scorpions,' Proceedings of the Dorset Natural History and Antiquarian Field Club, XIII. (1892), pp. 199-231.

1901 July 2.

I.

The four species identified from Lincolnshire are :—

Chthonius rayi L. Koch. Sent to Mr. Cambridge several years ago by Mr. Beaulah from Broughton, near Brigg. It occurs somewhat frequently under stones in Dr. George's garden at Kirton-in-Lindsey; and has recently been found by Mr. Carter under wood on the coast sand-hills at Trusthorpe, and under flints in a chalk-pit at North Ormsby. Mr. Carter remarks on the creature's activity, and on its habit, when disturbed, of running quickly backwards.

Chelifer latreillii Leach. Found by the writer, in 1886, under bark of dead-wood in a fence, near the sea, at Mablethorpe; and reported—as *Chelifer degeerii* C. Koch, a synonym by which the species was then known—in 'The Naturalist,' 1886, p. 339. One had eggs attached to the under-side of the abdomen. Subsequently others were found by me in the same spot; and some were brought thence to London by Mr. Gude. One or two of these were carrying eggs, which soon hatched, the parents becoming surrounded by numerous young. The animal was again observed during the meeting of Lincolnshire Naturalists at Mablethorpe in 1893.* Mr. Goulding found a specimen last year under an old boot on the Mablethorpe sand-hills; and Mr. Carter has sent me it from Trusthorpe, where he found it in some plenty under wood on the sand-hills. Mr. Cambridge mentions having received it from Mr. J. E. Mason, then of Alford,† by whom I am told that the specimens came from the coast sand-hills at Chapel St. Leonards, where the creature is not uncommon.

Chernes nodosus Schrank. Among slides of Pseudoscorpions mounted in Canada-balsam, which Dr. George has permitted me to submit to Mr. Cambridge, is one containing four individuals of this species—from the neighbourhood of Kirton-in-Lindsey. Mr. Larder has recently obtained a specimen from the leg of a fly caught on the wing at Louth.

Chiridium museorum Leach. Mr. Cambridge mentions having received this very little species—the Book-scorpion—from Mr. Beaulah, near Brigg, and from Dr. George, of Kirton-in-Lindsey.‡ I understand that Mr. Beaulah's specimens were from Raventhorpe. Dr. George found it, in July 1877, in great

* W. F. Baker, Naturalist, 1893, p. 261.

† O. P.-Cambridge, l.c.

‡ O. P.-Cambridge, l.c.

numbers in a deserted sparrow's nest in ivy on the groom's cottage adjoining his garden at Kirton-in-Lindsey.

II.

It was in September last that I received from Louth, through the kindness of Mr. Larder, the above noted specimen of *Chernes nodosus,* together with the fly to which it was attached. His brother saw the fly on the wing in a warehouse in Mercer Row, observed that it was carrying an unusual object through the air, caught it, and found the object to be a Pseudoscorpion, clinging by closure of the pincers of one of the great pedipalps to one of the legs of the fly. On the following day another fly similarly encumbered was observed on the wing in the same warehouse. The questions involved in these observations are of considerable interest; but the subject is by no means new, and it has already been referred to in 'The Naturalist' itself, Mr. Cambridge having noted, in the volume for 1884-5, two cases of the attachment to flies of this same *Chernes nodosus.* One specimen was received from Mr. Meade, of Bradford; and the other from Mr. Roebuck with a note that it had been taken at Bradford by Mr. W. West attached to the leg of a house-fly.*

Poda, one hundred and forty years ago, made a reference to the subject, noting of a Pseudoscorpion supposed by him to be the Linnean *Acarus cancroides:* Repertus in pedibus *muscæ,* quos chelis suis firmissime apprehendit;† and in 1787 George Adams recorded the finding by Mr. Marsham of one of these 'lobster insects' 'firmly fixed by its claws to the thighs of a large fly, which he caught on a flower in Essex the first week in August, and from which he could not disengage it without great difficulty, and tearing off the fly's leg.'‡ Hermann, in 1804, figured his *Chelifer parasita,* noting that it was found adhering to a fly.‖ The next available item appeared in 1831 in Loudon's 'Magazine of Natural History':

A Lobster-like Insect Attacking the Leg of a House-fly.—As I was yesterday reading in the parlour, my attention was accidentally attracted to a common house-fly, which was chafing its fore-legs in a very unusual way. On closer examination, I found, to my surprise, that a small insect was firmly attached to one of its legs, which the fly was ineffectually endeavouring to dislodge. On applying a magnifying glass, my surprise was greatly increased by finding that the insect which had seized the fly's

* O. P.-Cambridge, Naturalist, 1884-5, p. 103.

† N. Poda, 'Insecta Musei Græcensis,' 1761, p. 122.

‡ G. Adams, 'Essays on the Microscope,' 1787, p. 386.

‖ J. F. Hermann, 'Mémoire aptérologique,' 1804, p. 117.

leg had claws precisely resembling those of a lobster, with one of which it had grasped the unfortunate fly; its body was flat, like a bug (Cimex), and resembled that insect in colour but was smaller. I unfortunately lost sight of the fly in an unsuccessful attempt to capture it. . . . O., London, July 19. 1830.*

The animal, as Professor Henslow suggested at the time, was certainly a Pseudoscorpion.† Subsequently the same correspondent recorded two other similar observations;‡ and W.B.B.W. in the same magazine stated that he had often taken '*Chelifer cancroides*' and other Chelifers attached to the legs of the house-fly (*Musca domestica*) and two other Diptera.‖ A further observation was communicated, in 1835, by Mr. G. Moore to 'The Entomological Magazine':

Last summer I watched the manœuvres of a *Musca Domestica* that had one of these crab-like dependents [*Chelifer cancroides*] attached to its *femur*. It was in the window of a cold and damp out-office. The fly appeared but little annoyed, and continued to travel tardily about the glass, while its hanger-on busily occupied its free claw in seizing such minute objects as came in its way,—at least such appeared to be its business. On attempting to catch the fly, off it flew to another window with its wingless passenger. I followed closely and quickly, when lo! the little appendix relaxed its grasp, and dropped itself into a crevice in the frame, where I secured it.§

An anonymous editorial note adds that the '*Chelifer cancroides*' is abundant on planks and bricks placed on decayed vegetable matter, and that *Lonchæa vaginalis*, a little fly common in the same situations during June, is particularly infested by it, and also by *Acari*. The fly, apparently uninjured, is seen on windows, the note says, with the Chelifers attached to its trochanters.** Dr. H. Loew mentions having found, in August 1841, another little fly, *Ulidia demandata*, running about in numbers on dry stems on a waste place on the parade-ground at Ofen, and so pursued by '*Chelifer corallinus*' that it was difficult to find specimens free from the attachment of this Arachnid.†† Dr. Gerstaecker, of Berlin, in 1862, reported the

* O., Loudon's Magazine of Natural History, IV. (1831), p. 94.

† J. S. Henslow, ibid., p. 284.

‡ O., ibid., V. (1832), p. 754.

‖ W.B.B.W., ibid., VII. (1834), p. 162; and see also 'Beobachtungen englischer Naturforscher über die Afterskorpione,' Archiv für Naturgeschichte, Jahrg. I. (1835), Bd. 2, p. 186.

§ G. Moore, Entomological Magazine, II. (1835), p. 321.

** Ed., Entomological Magazine, II. (1835), p. 322. Edward Doubleday is understood to have edited this volume in place of Edward Newman, who was responsible for the others; but the note may be by Francis Walker, or some other member of the old Entomological Club.

†† H. Loew, 'Dipterologische Beiträge,' 1845, p. 29.

finding on an old oak of a Hover-fly (*Brachypalpus laphriformis*) and a species of *Anthomyia*, each with an unidentified Pseudoscorpion clinging to one of the hind-legs.* Mrs. Lane Clarke wrote of '*Chelifer*' in 1858:

> This parasite attacks flies. I have seen a common fly run wildly about upon the window-pane, shaking itself violently, and apparently in great distress. Upon catching it, I found a small scorpion-like creature fixed upon one of its thighs, by a pair of tremendous claws,—hardly could it be detached for examination, and then it ran quickly, like a crab, sideways.†

Mr. Stainton told the Entomological Society of London, in September 1865, that he had that autumn noticed an unusual number of Chelifers on the legs of house-flies;‡ and other cases have been reported by Mr. Bailey,‖ Professor Leydig,§ Mr. M'Intire,** Mr. Bisshopp,†† and by J. S.‡‡ The last observer compares the Pseudoscorpion hanging to the leg of the fly to a parachute attached to a balloon. He sent the creature to 'The Entomologist,' and according to Mr. Newman's identification it was '*Chelifer cancroides*.'‖‖ In a case recorded by Mr. Macrae, in 1869, the fly was small and weakly and the Chelifer strong and active:

> I saw the fly on the window at lunch, and noticed something attached to it, but missed taking it. Strange to tell, it dropped in my wine-glass at dinner, so that I secured both.§§

Mr. Preudhomme de Borre has reported an observation made in July 1872, in a house in Liége, in which a Pseudoscorpion attached to the leg of *Musca domestica* is said to pertain to *Chelifer panzeri* C. Koch = *Chernes cimicoides* Fabr. A second observation was made a few days afterwards.¶ Mr. C. W. Dale, in enumerating the Pseudoscorpions of Glanville's

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* A. Gerstaecker, 'Bericht über die wissenschaftlichen Leistungen im Gebiete der Entomologie,' 1859-1860, p. 347.

† L. L. Clarke, 'The Microscope,' 1858, p. 146.

‡ H. T. Stainton, Transactions of the Entomological Society of London (3), II. (1864-6), p. cxii.; and Entomologist's Monthly Magazine, II. (1865-6), p. 120.

‖ G. Bailey, Hardwicke's Science-Gossip, 1865, p. 227.

§ F. Leydig, 'Skizze zu einer Fauna Tubingensis,' 1867, pp. 16-7.

** S. J. M'Intire, Hardwicke's Science-Gossip, 1869, p. 246.

†† E. F. Bisshopp, Entomologist, V. (1871), p. 428.

‡‡ J. S., ibid., VIII. (1875), p. 185.

‖‖ E. Newman, ibid., p. 186.

§§ G. Macrae, Hardwicke's Science-Gossip, 1869, p. 283.

¶ A. Preudhomme de Borre, Verhandlungen der k.-k. zoologisch-botanischen Gesellschaft in Wien, XXIII. (1873), p. 36.

Wootton, in 1878, has noted of *Obisium muscorum* that it is 'fond of catching hold of the legs of flies';* but this, I understand, is a mistake, the Chelifer referred to being *Chernes nodosus*. Mr. de Courtois de Langlade, who writes from Arles-sur-Rhône, states that one of his sons who had been examining a heap of flies caught in a trap had found very small Scorpions on the legs of a number of them;† and Dr. Hess, more recently, has reported the occurrence of a Pseudoscorpion referred to *Chelifer cancroides* on one of the front legs of a house-fly at Mulhouse (Alsace); he records in this connection an interesting experiment to which we shall recur.‡ A number of cases observed in England from time to time were reported by Mr. Cambridge in 1892. The Pseudoscorpion in every case proved to be *Chernes nodosus*, specimens of which, found attached to legs of flies, were received by Mr. Cambridge from Mr. Dale, Granville's Wootton; Mr. Campbell, Hoddesdon, Hertfordshire; Mr. F. O. P.-Cambridge, Carlisle; Mr. Stoddart, Bristol; Mr. Bignell, Stonehouse, Devon; and twice, as above noted, from Bradford.‖ Mr. Campbell informs me that his specimen was caught on the leg of a blow-fly, on a window, in October 1887. The distinguished arachnologist, Simon, states that observations of the present kind have been made not only in Germany, Switzerland, France [and other European countries], but also in Algeria, and in America.§ Of the American observations, Professor Leidy mentions having occasionally met with *Chelifer cancroides*? attached to the house-fly;** and Mr. Banks has reported the attachment of his *Chernes pallipes*, in Colorado, to a fly of the family Dexiidæ.†† According to Dr. Hagen, *Chernes sanborni* attaches itself to the legs of flies in Massachusetts, and *Ch. loewii* in Panama. Hagen mentions also that a single *Obisium* had occurred to him in America on a daddy-long-legs (*Tipula*).‡‡ Professor Berg has reported a case observed in a house by

* C. W. Dale, History of Glanville's Wootton, 1878, p. 325.

† F. de Courtois de Langlade, La Nature, XI. (1883), 1er semestre p. 71; and see also P. Mégnin, ibid., XIV. (1886), 2e semestre pp. 241-3.

‡ W. Hess, 'Über die Pseudoscorpioniden als Räuber,' Zoologischer Anzeiger, XVII. (1894), pp. 119-21.

‖ O. P.-Cambridge, 1892, l.c.

§ E. Simon, 'Les Arachnides de France,' VII. (1879), pp. 11-12, 33-34.

** J. Leidy, Proceedings of the Academy of Natural Sciences of Philadelphia, 1877, pp. 760-1.

†† N. Banks, Entomological News, VI. (1895), p. 115.

‡‡ H. Hagen, Zoologischer Anzeiger, II. (1879), pp. 399-400.

Mr. Backhausen while engaged on the Argentine-Chilian Boundary Commission;* and we have, moreover, the following interesting note from Mr. F. Knab, of Chicopee, Massachusetts:

> A few days ago my father captured a troublesome fly, and, as he held it, found to his surprise that three Pseudoscorpions had left it and were crawling rapidly over his hand. Upon this more flies were captured and three found infested with Pseudoscorpions. Of fifty flies captured the following day two carried Pseudoscorpions; one had two attached to a single leg. In each case the Pseudoscorpion hung on by a single pincer.†

More than one Pseudoscorpion, as we see from the just-quoted note, may be carried by a single fly. This fact, though concealed by me until now, has long been known. Dr. F. Löw has reported the occurrence, on a window in September 1861, of the little *Ulidia erythrophthalma,* to the hind legs of which, clinging symmetrically, were two specimens of *Chernes wideri* C. Koch.‡ Another fly, to one of the legs of which two Pseudoscorpions were attached, was exhibited by Hagen in 1867 to the Boston Society of Natural History;‖ the Pseudoscorpions in this case pertained, I believe, to the *Chernes sanborni* already mentioned. One gathers, moreover, that some of the flies referred to by Mr. de Courtois de Langlade had two or three Pseudoscorpions upon them; and Mr. Stainton in the communication to the Entomological Society of London already quoted mentioned having seen a fly with three of these Arachnids on the same leg. Dr. Loew states that some of the *Ulidia demandata* observed by him were beset with three or more Pseudoscorpions; and the writer of the editorial note in 'The Entomological Magazine' refers to the attachment of from one to four to the legs of *Lonchæa vaginalis.* The Rev. L. Jenyns (afterwards Blomefield) mentions having taken, from one small fly, four specimens of *'Chelifer geoffroyi'*;§ a *Musca domestica* produced to Dr. Lukis, of Guernsey, in August 1832, had four specimens of *'Chelifer cancroides'* affixed to one leg;¶

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* C. Berg, 'Pseudoscorpionidenkniffe,' ibid., XVI. (1893), pp. 446-8.

† F. Knab, Entomological News, VIII. (1897), p. 13.

‡ F. Löw, Verhandlungen der k.-k. zoologisch-botanischen Gesellschaft in Wien, XVI. (1866), p. 944. Another example of the clinging of a Pseudoscorpion to a small fly is mentioned by Löw, ibid., XVII. (1867), p. 746.

‖ H. Hagen, Proceedings of the Boston Society of Natural History, XI. (1867), pp. 323-4; Record of American Entomology, 1868, pp. 48-52.

§ L. Jenyns, 'Observations in Natural History,' 1846, p. 295; the *Chelifer geoffroyi* Leach is a *Chernes.* The author adds—I do not know on what authority—that these animals 'are often found on *Tipulæ.*'

¶ F. C. Lukis, Loudon's Magazine of Natural History, VII. (1834), p. 163.

and Dr. v. Wagner (1892) has published an interesting account of a Tipulid fly (*Ctenophora pectinicornis*)—one of the larger daddy-long-legs—whose extremities carried the same number of individuals of a *Chernes,* not identified specifically, but thought to be *Chernes hahnii* C. Koch = *Chernes cimicoides.** The fly, which was caught in Mecklenburg, is represented, with two of the Pseudoscorpions, in the accompanying figure. Dr. Schiner, further, has reported the capture, in August 1870, of the little *Ulidia demandata* with no less than five Pseudoscorpions hanging to its hind-legs. The fly was on a window, and it is noted that it walked and flew in a lively manner, and did not seem inconvenienced by its numerous guests. These, as in the last case, were thought to be *Chernes hahnii* = *Chernes cimicoides.*†

A **Daddy-long-legs** (***Ctenophora pectinicornis***) with **Pseudoscorpions** (***Chernes*** sp.) on its legs; slightly enlarged. The supplementary figure shows one of the Pseudoscorpions more enlarged. Both after F. v. Wagner, Zoologischer Anzeiger, XV. (1892), p. 435. The manner of attachment here shown, namely, by both pincers, is unusual. The animals generally hang by one pincer only.

But our limit is not yet reached, for at the Entomological Society of London, in September 1866, Mr. Stevens exhibited a house-fly to which six Chelifers were attached, and he stated that he had observed another on which were no less than eight.‡ Finally, if Hagen was not mistaken, even ten have been seen on a single insect.‖

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* F. v. Wagner, Zoologischer Anzeiger, XV. (1892), pp. 434-6.

† J. R. Schiner, Verhandlungen der k.-k. zoologisch-botanischen Gesellschaft in Wien, XXII. (1872), pp. 75-6.

‡ S. Stevens, Transactions of the Entomological Society of London (3), V. (1865-7), p. xxvii.

‖ H. Hagen, 1868, l.c.: 'Many cases are quoted by naturalists who have observed one or more Chelifers, even ten, strongly attached with their hands to the legs of insects.'

The animals do not confine their attentions to Diptera. Certain kinds are found in widely-separated parts of the world in hives and nests of bees; and Mr. E. T. Wells, writing from Cape Colony, has informed us that the creatures, at one time numerous in his hives, were sometimes seen hanging to the legs of the bees.* Another case concerning Hymenoptera is that of Menge, who reports the finding of a fossil Pseudoscorpion in amber attached to the leg of a fossil ichneumon.† We have one note concerning Orthoptera, Dr. Joseph having more than once taken his *Chernes cavicola* in the Grotto of Corgnale, Austria, hanging to the long-legged cave Locustid *Rhaphidophora cavicola.*‡ The creatures are found also on Coleoptera, but as the association is here of different character we may first mention that they cling also to certain Arachnida, namely, to Phalangiids — the long-legged false-spiders or harvest-men. A note to this effect, by the Rev. W. W. Spicer, is found in one of the early volumes of 'Hardwicke's Science-Gossip':

In the course of a walk lately through a shady lane near Bath, I came suddenly upon three or four harvest spiders (*Phalangium opilio*). As they scampered away I observed that one of them had a dark object on its right fore leg, which evidently formed no part of its normal structure. On securing my long-legged friend, and examining the object with a lens, I found, to my great surprise, that it was a specimen of *Chelifer cancroides*, which had fixed itself to the leg, and was holding on 'like grim death.' Indeed, so tightly was the little creature attached, that I had some difficulty in making it let go, in order to transfer it to a bottle.

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* E. T. Wells, British Bee Journal, XXVII. (1899), p. 126. The occurrence of Pseudoscorpions in bee-hives in Europe has been reported in the same journal by Mr. Hamlyn-Harris. In Parà, one has been found in numbers in nests of a social bee, *Melipona mutata* (Dr. Göldi); and it appears that there are Myrmecophilous and Termitophilous kinds. The finding of Chelifers in ants' nests was long ago noted by Professor Haldeman; and one has been reported, also from North America, from the nest of *Aphænogaster fulva* (Theo. Pergande). A small kind has been found living with *Camponotus cognatus* (Cape Colony, Dr. Brauns), and another with *Atta discigera* (Joinville, J. P. Schmalz). As regards Termites, the creatures have been found with *Termes tubicola* in Orange River Colony (Dr. Brauns), and with *Termes natalensis* in Natal (Dr. Haviland). These facts are from Wasmann, 'Kritisches Verzeichniss der myrmekophilen und termitophilen Arthropoden,' 1894, p. 193, and Deutsche entomologische Zeitschrift, 1899, p. 411. I have learned nothing of the behaviour of the Chelifers towards the *Melipona*, the ants, and the Termites. It appears from the remarks of Mr. Hamlyn-Harris that hive-bees avoid the creatures, apparently on account of their singular deportment and the threatening movements of the pedipalps.

† A. Menge, 1855; quoted by Hagen, 1868, l.c.

‡ G. Joseph, Berliner entomologische Zeitschrift, XXVI. (1882), p. 22.

The Chelifer was attached to the hard tibia.* Professor Leydig, in his Sketch-fauna of Tübingen, has recorded observations of the same kind: he states that he has more than once seen Pseudoscorpions on the *Phalangium opilio*.† In the case of Coleoptera, Pseudoscorpions do not, as far as is known at present, attach themselves to the legs. They occur on the dorsal surface of the hind-body, hidden away under the wings and elytra; and according to Hagen the species thus found pertain mainly to *Chernes*.‡ Several observations made in North America relate to the large and common elater *Alaus oculatus*. Professor Leidy, in 1877, recorded the finding of six individuals of his *Chernes alius* beneath the elytra of this beetle at Easton.‖ A similar observation—*Alaus oculatus* with one Chelifer—had previously been reported from Ohio;§ and Professor Haldeman, in 1848, had recorded the finding of nine near the extremity of the hind-body, under the wings and elytra, of this same beetle.** Numerous cases have been reported from South America. Dr. v. Jhering, writing from Rio Grande do Sul, says that he has often found Pseudoscorpions under the elytra of two species of the brilliantly-luminous Elaterids of the genus *Pyrophorus*; and he once found one, similarly situated, on the great palm-weevil (*Rhynchophorus palmarum*).†† Professor Leydig, in dissecting a spirit specimen of the harlequin-beetle (*Acrocinus longimanus*)—a great South American Longicorn—found a solitary Chelifer in the usual position;‡‡ and Hagen once received three specimens from Surinam with a note that they were found under the elytra of

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* W. W. Spicer, 'Helps to Distribution,' Hardwicke's Science-Gossip, 1867, pp. 244-5.

† F. Leydig, op. cit.

‡ H. Hagen, 1879, l.c.

‖ J. Leidy, l.c.

§ B. P. Mann, Proceedings of the Boston Society of Natural History, XI. (1868), pp. 325.

** S. S. Haldemann, Silliman's American Journal of Science and Arts (2), VI. (1848), p. 148.

†† H. v. Jhering, 'Zum Commensalismus der Pseudoscorpione,' Zoologischer Anzeiger, XVI. (1893), pp. 346-7.

‡‡ F. Leydig, op. cit.; Verhandlungen des naturhistorischen Vereines der preussischen Rheinlande u. Westfalens, XXXVIII. (1881), p. 180; and 'Zum Parasitismus der Pseudoscorpioniden,' Zoologischer Anzeiger, XVI. (1893), pp. 36-7.

the same species of beetle.* Dr. Balzan mentions the occurrence of *Chernes argentinus* Thorell on a night-flying Longicorn of the genus *Achryson*.† Other observations relate to Lamellicorns of the genus *Passalus*. Mr. C. O. Waterhouse records the discovery of two specimens of a '*Chelanops*' under the elytra of *Passalus punctiger* from Rio Janeiro;‡ and in Australia, according to Hagen, an undescribed Pseudoscorpion has been found on *Passalus politus*.‖ Finally, we have a note from North Celebes by Professor Hickson. In pulling off the elytra of a Longicorn, *Batocera celebiana*, he found fixed to the wings a large number of little creatures, which turned out to be Chelifers or tailless Scorpions.§

As regards the kinds of Pseudoscorpions in which the habits above noted obtain, it must be remembered that with animals of the present kind names, in the hands of writers other than specialists, have not the value they usually possess in more familiar departments of zoology. *Chelifer cancroides*, for instance, derived from the Linnean *Acarus* or *Phalangium cancroides*, was long a stock name for Pseudoscorpions of almost any kind;** and its use, more especially by earlier writers, rarely implies any attempt at specific discrimination. Next to the Linnean species, in point of date of bestowal, comes *Scorpio cimicoides* Fabr.—afterwards *Chelifer* or *Chernes cimicoides*—and this title also, it can hardly be doubted, has often been applied to species other than the one to which it is now attached. The German arachnologist L. Koch states his experience that the species found attached to flies is always *Chernes reussii* C. Koch = *Chernes nodosus*.†† Stecker, referring to this remark, states that *Chernes cimicoides*, not *Chernes*

* H. Hagen, 'Chelifer als Schmarotzer auf Insekten,' Stettiner entomologische Zeitung, XX. (1859), p. 202; 1867, l.c.; 1868, l.c.; 1879, l.c.

† L. Balzan, Annali del Museo Civico di Storia Naturale di Genova (2), IX. (1890), p. 416; and Annales de la Société entomologique de France, LX. (1891), p. 498.

‡ C. O. Waterhouse, Transactions of the Entomological Society of London, 1875, p. xii.; and Entomologist's Monthly Magazine, XII. (1875-6), p. 20.

‖ H. Hagen, 1879, l.c.

§ S. J. Hickson, 'Naturalist in North Celebes,' 1889, p. 101.

** M. C. Cooke, Journal of the Quekett Microscopical Club, I. (1868), p. 15.

†† L. Koch, 'Uebersichtliche Darstellung der europäischen Chernetiden (Pseudoscorpione),' 1873, p. 6.

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nodosus, occurred to him under these conditions.* But the experience of Simon in France is in agreement with that of Koch. All the European Pseudoscorpions found on flies' legs by Simon and by his correspondent Mr. Ray, of Troyes, proved to be *Chernes nodosus*;† and Mr. Cambridge, in England, who does not mention the finding of any other species thus situated, states that all, or nearly all, of the individuals of *Chernes nodosus* communicated to him from different parts of the country were obtained from the legs of flies.‡ To this species, moreover, Simon is inclined to refer the *Acarus cancroides* L. of Poda, and the *Chelifer parasita* Hermann. In America, also, the fly-infesting species appear to be chiefly *Chernes,* and we have noted in this connection *Chernes sanborni* Hagen, *Chernes pallipes* Banks, etc. Those found on legs of harvest-men have not been critically examined; but that discovered on an Orthopteron was, as we have seen, *Chernes cavicola* Joseph. We have already quoted the opinion of Hagen that the Pseudoscorpions associating with beetles are mainly *Chernes,* and of those which have been named we have *Chernes alius* Leidy and *Chernes argentinus* Thorell.

The meaning of the phenomena now detailed has been much discussed; but it was admitted by Simon in 1879 that no satisfactory explanation had been given. J. S., who sent a Pseudoscorpion and fly to 'The Entomologist' in 1875, asking the name of the animal, and the object of its aerial journey, would hardly be satisfied with Mr. Newman's reply:

> The first question is easily answered; the second is a problem more difficult of solution. The insect is Chelifer cancroides. I once found it in vast numbers under the bark of a willow tree on the banks of the New River. . . . Still we have to deal with its strange propensity to settle itself on the legs of flies. It is, of course, very natural to suppose that these flies, having a decided weakness for settling on the trunks of willows, and that these scorpion-like creatures, having a similar weakness for the toes of a fly, should fix themselves thereupon; still there is something that requires explanation.‖

According to one view the Pseudoscorpion is parasitic, and according to another it is predaceous. But the creature, compared with the insects to which it is found attached, seems too large to be a parasite and too small to be an animal of prey—*Chernes nodosus* is 2·5 mm. or slightly over one line in length—

* A. Stecker, Deutsche entomologische Zeitschrift, XIX. (1875), p. 314.

† Simon, l.c.

‡ Cambridge, 1885, l.c., 1892, l.c.

‖ Newman, l.c.

and thus a third view has sprung up, namely, that the animal is a passenger, using the insect as a means of conveyance from place to place, from one feeding ground to another. There is still a further theory, that the Arachnid resorts to the insect to seize parasitic *Acari*. This idea possesses a certain fascination; but it is not supported by evidence; and Mr. Dale has dismissed it (in a letter with which he has favoured me) with the remark that some flies laid hold of by Chelifers have no infesting mites.

An early expression of the view that the Arachnid is merely a passenger is contained in the already quoted communication by Mr. Moore:

> Does not the *Chelifer* experience inconvenience, in consequence of its construction, when it would be pursuing its prey? and does it not take advantage of the leg which the fly so readily offers that it may ride out on its hunting excursions, and, by the aid of the fly's legs and wings, get cheaply conveyed from place to place?

This was the view of Hagen,* and it has been supported by Simon and Cambridge, as well as by other observers, among whom are Dr. v. Wagner and Professor Moniez.† It is favoured by the fact that Diptera, with attached Pseudoscorpions, are seen flying through the air, and Phalangiids hurrying over the ground, the Pseudoscorpions the while appearing in a state of inactivity, passively hanging generally by but one claw to a limb of the conveyor. Hagen has remarked that the creatures cannot obtain nourishment from the hard limbs, and that, except when associating with beetles, they are always found on the limbs, not on the softer body. Mr. Spicer, referring particularly to Phalangiids, has made the same remark. Simon and Cambridge have emphasized the statement that the creatures do not appear to injure their hosts, Diptera, etc., continuing to fly freely notwithstanding the presence of their comparatively formidable guests. This has been remarked upon by several observers, and we have seen that a small fly with five *Chernes* attached yet flew and walked in a lively manner. Further, in support of the present view, we have a direct observation by Mr. Moore, who saw a Pseudoscorpion which had been carried by a fly from one window to another, relax its grasp and drop into a crevice. One can imagine that the attachment may be a more or less accidental circumstance. The little creatures are

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* Hagen, 1867, l.c.; 1868, l.c.

† F. v. Wagner, l.c.; R. Moniez, 'A propos des publications récentes sur le faux parasitisme des Chernétides sur différents Arthropodes,' Revue biologique du Nord de la France, VI. (1894), pp. 47-54.

accustomed to use the great pedipalps for seizing objects of various kinds,* and for attack and defence. They are exceedingly pugnacious, and when annoyed they brandish the pedipalps and open and shut the pincers in a ferocious, even ludicrous, manner. They are apt, moreover, to assume a condition of blind rage, and at such times they will grasp with the pincers any small object which opposes them. Mr. M'Intire, offering a camel's hair pencil to an angry Chelifer, found that it readily seized the brush and allowed itself to be carried some distance. We can understand, I think, from these facts, that Pseudoscorpions annoyed by flies walking over them or entering their retreats would naturally seize the insect's legs, and it is obvious that the insects, being several times the size of the Arachnids, would have no difficulty in flying away with them. It is clear, moreover, that the creatures may thus be carried to considerable distances, for, refusing to acknowledge themselves beaten—and perhaps imagining that they have caught the fly—they often keep the pincer tightly closed and hold on for a long time with extreme tenacity. Dr. Hess, who kept a fly and Pseudoscorpion in captivity, did not observe any material change in the Arachnid's position after fifty-six hours. The creatures may detach themselves voluntarily as above noted, and they have been known to do so when the fly is caught by a naturalist; but this rarely happens, the Pseudoscorpion usually retaining its hold even when the fly is considerably handled for observation. One of Dr. Löw's specimens retained its grasp even when subjected to partial stupefaction with ether; and the other, though it became detached, immediately resumed its position on awakening. When the *Ctenophora* above mentioned was killed in alcohol two of the four *Chernes* fell off, but the other two kept their positions, falling off only when removed from the spirit. Professor Moniez mentions that he preserves Pseudoscorpions and a fly, plunged alive into spirit, but still in position; and we have, further, the case of the Chelifer in amber still attached to the leg of an ichneumon. This means of dispersal—if a means of dispersal only—is a remarkable one; but it is not without its parallel in nature. Bivalve molluscs often close their shells on the toes of flying water-insects and birds as well as on those of frogs, toads, newts, etc.; and this is clearly an accidental

* Albin, 'Natural History of Spiders and other Curious Insects,' 1736, p. 56: 'It had two long things,' says the author, of a Chelifer, 'like the claws of a lobster, and would use them as a crab or lobster doth to pinch or lay hold of anything.'

circumstance, serving the purpose of dispersal. The creatures, thus clinging by closure of the shell, are carried through the air and along the ground just as Pseudoscorpions are while clinging by a closed pincer to the legs of flies, harvest-men, etc. Operculate snails, moreover, occasionally cling accidentally to legs of insects, by closure of the operculum. And in this connection one may refer also to the clinging of certain biting-lice to winged parasitic bird-flies: a habit which doubtless secures dispersal.* Dr. Lukis, referring to the case in which a house-fly had four Pseudoscorpions on the same leg, has doubted whether the attachment can be accidental. If this be the case, he says, 'I am at a loss to conceive how so many . . had attached themselves to one limb? If the fly had accidentally placed the limb in a nest of these insects, it seems natural to believe that it would have had sufficient sensibility to withdraw it ere the whole family had time to attach themselves.' In reply, however, one might bring forward cases, of which I have elsewhere given particulars, of a water-bug with three bivalves accidentally attached to its toes—of newts with four, toads with six, and crayfish with eight shells similarly attached. It might be argued, perhaps, that the attachment, at first accidental, but proving valuable as a means of dispersal, has been encouraged by natural selection, and has thus the character of a separate instinct. Professor Moniez, who appears to go a step further, has supposed the attachment of Pseudoscorpions to be intentional, the creatures being believed to seize the legs of insects for the express purpose of getting themselves transported. He relates that each time he had wished to exhibit Pseudoscorpions to his pupils he had easily obtained specimens by the following

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* At a meeting of the Entomological Society of London, in 1890, Dr. Sharp exhibited *Ornithomyia avicularia*, from Dartford, to which were adhering—apparently by their mandibles—several specimens of a mallophagous louse (1). The *Ornithomyia* is a flying Dipteron that infests birds, and it is believed that Mallophaga are transferred by this means from one bird to another (2). Lt.-Col. Walker (3), moreover, has recently reported the capture of a specimen of the same fly which was leaving a recently-shot blackbird, and to which, hanging on like a bulldog, was a biting-louse agreeing with Denny's figure of *Nirmus merulensis*. This was the second instance which had come to the observer's notice of a mallophagous insect attaching itself to *Ornithomyia*; in both cases it adhered to the posterior part of the hind-body. (1) D. Sharp, Transactions of the Entomological Society of London, 1890, p. xxx.; (2) D. Sharp, 'Cambridge Natural History,' V. (1895), pp. 350-1; (3) H. J. O. Walker, 'Bird-louse Changing Hosts,' Science-Gossip (n.s.), VII. (1900), p. 191.

proceeding, which had been inspired by the observations of his predecessors and by the ascertaining of the fact that the creatures occurred in some plenty in a manure heap in the open air at Lille. It sufficed to catch flies, to cut off a wing, and to place them under a bell-glass on the manure-heap; generally, in these circumstances, after a very little time, one might find the Pseudoscorpions fixed by their pincers to the legs of the Diptera, and Moniez's conclusion was that they could not resist the desire to quit the place where they were whenever the opportunity for a ride presented itself to them. It is noted, however, that while *Chernes nodosus, Chelifer cancroides,* and *Roncus lubricus* occurred in the manure-heap in about equal numbers, this supposed desire for passive aerial locomotion obtained only in the *Chernes* and *Chelifer,* the *Roncus* never attaching itself to the flies. The attachment, whether accidental or intended, obviously serves for dispersal; but it is probable that it is not a means of dispersal only, the phenomena having, almost certainly, a further significance.

It was the opinion of several of the earlier writers that the fly-infesting Pseudoscorpions are parasitic. This was the view of Hermann, and of Leach,* and also in more recent years of Professor Leydig;† and notwithstanding the Pseudoscorpion's diminutiveness it is probable that those found attached to flies, etc., are attacking the relatively gigantic creatures for the purpose of obtaining food from them. Several recent observers look upon the Pseudoscorpions under these conditions as predaceous rather than parasitic, and justly so I think; but the distinction is not of great importance, for it merely turns upon the question whether the Arachnids obtain their nourishment during the life of the insect or only after its death. These animals are generally stated to feed on minute insects and mites and their larvæ, and they are seen to seize such creatures—book-lice, spring-tails, etc.—with their pincers and convey them

* W. E. Leach, 'On the . . . Scorpionidea, with descriptions of the British species of Chelifer and Obisium,' Zoological Miscellany, III. (1817), pp. 48-53.

† Professor Leydig compares the Pseudoscorpions, somewhat inaptly, to Hydrachnids or water-mites during their youth, at which time they are parasitic on the legs and bodies of water-beetles and -bugs. Reference might be made also to the larvæ of Trombidiids or velvety land-mites which we commonly see, like little red beads, adhering to harvest-men. These are cases of true parasitism, the attachment of the larvæ (whose imagines are free) being essential to their existence; and at the same time, doubtless, highly useful as a means of dispersal.

thus to the mouth. It is probable that the greater part of the food of most Pseudoscorpions consists of small fry of this kind; but it is certain that some sorts, more especially *Chernes,* occasionally or habitually attack larger creatures. Mr. Blomefield, as long ago as 1846, appears to have had no doubt on this point, for he remarks of *Chernes* that their habitat appears to be under bark, 'whence they probably spring out on their unwary prey [flies] basking near.' According to Stecker, indeed, *Chernes* sponges on flies and earwigs, *Chelifer* on bugs, and *Chthonius* on woodlice, etc.* Dr. George informs me that he once saw a Pseudoscorpion at Kirton-in-Lindsey seize a fly, first with one pincer, then with the other, then with the mouth, and carry it about like a cat with a mouse. This note was made in 1879, and Dr. George has now no clear recollection concerning the fly, which was probably somewhat small. The observation is of interest, however, suggesting as it does that it is mainly a question of size whether the attacked insect will be at once overcome or whether it will lift the little assailant from its feet. It is difficult to understand why *Chernes,* etc., to which presumably small prey are generally accessible, should make bold to attack large creatures. The house-fly in this connection is sufficiently gigantic, while such creatures as *Ctenophora pectinicornis* and *Phalangium opilio* are relatively enormous. It may be remarked, however, that while *Chthonius* possesses four eyes, and *Chelifer, Roncus,* etc. two, *Chernes* is blind; and it may be that it is unable accurately to estimate the size of the animals whose legs it seizes. It is true that the encumbered creatures usually appear uninjured; but this, perhaps, is because the Arachnids have not had an opportunity of pressing the attack; and it is improbable, I think, that the hosts generally escape injury or even survive. We have already quoted the case in which the fly was weakly and the Chelifer strong and active, the two ultimately falling into a wine-glass. The fly from which Mr. Blomefield took four *Chernes* was 'so fettered in its movements by the grasping hold of so many aggressors at once, as hardly to be able to crawl'; and Mr. Stainton, in 1865, remarked that house-flies were powerless to get rid of Chelifers, and that these Arachnids, according to his experience, did not quit the flies until the latter died. Dr. Lukis, moreover, has informed us of having seen '*Chelifer cimicoides*' dragging by the legs

* A. Stecker, Sitzungsberichte der k. Akademie der Wissenschaften (Wien), LXXII. (1875), p. 517.

the dead carcass of *Stomoxys calcitrans*—a Dipteron as large as the house-fly and resembling it in build.* The often-repeated statement that Pseudoscorpions are always noticed on the legs, not on the bodies, of flies is in need of modification. Donovan, in 1797, recorded the finding of a Pseudoscorpion 'fastened on the body of the *Musca Vomitoria* . . . from which it could not be extricated without killing and tearing the fly into pieces';† and in 1826 the following paragraph appeared in the pages of Kirby & Spence:

> Another insect, remarkable for its resemblance in some respects to the scorpion—called in this country the book-crab (*Chelifer cancroides*), from its being sometimes found in books—occasionally is parasitic upon flies, especially the common blue-bottle-fly (*Musca vomitoria*). They adhere to it very pertinaciously under the wings; and if you attempt to disturb them, they run backwards, forwards, or sideways, with equal facility.‡

A recent American writer mentions having received a Pseudoscorpion found, apparently, under the wing of a house-fly;‖ and one gathers also that some of the Pseudoscorpions mentioned by Mr. de Courtois de Langlade were on the thorax of the flies to which he refers. It thus appears that Chelifers occasionally manage to leave the legs and effect a lodgment on the bodies of their transporters; and it is quite likely, in these cases, that they contrive to suck the juices of the living animal. But, from a consideration of all the facts above quoted, particularly those of Mr. Stainton and Dr. Lukis, and from certain other facts still to be given, it is probable, I think, that the creatures more usually remain on the legs till the insects die. Perhaps they thus remain because they are unable to proceed further, or possibly their policy is, by persistently clinging to the legs, to tire out the insect, cause its death, and then suck the juices of the carcass.

It would be interesting to know the fate of encumbered flies kept in captivity. Mr. Moore put a Chelifer in a pill-box with a fly, the leg of which it soon seized; but next morning he found that the Chelifer not the fly had died. This, however, is not surprising, for confinement in pill-boxes is quickly fatal to animals of many kinds. The anonymous writer in 'The Entomological Magazine' confined *Lonchæa vaginalis* and Chelifers in a bottle, and afterwards added other flies:

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* F. C. Lukis, Loudon's Magazine of Natural History, IV. (1831), p. 284.

† E. Donovan, 'Natural History of British Insects,' VI. (1797), p. 84.

‡ Kirby & Spence, 'Introduction to Entomology,' IV. (1826), pp. 228-9.

‖ F. M. Webster, Entomological News, VIII. (1897), p. 59.

The other day we put several of both into a bottle, and often, when the fly approached the *Chelifer,* the latter immediately extended one of its claws, and seized the fly by the end of the *tarsus*; with the other claw it grasped either the middle of the *tarsus*, or the costal nervure of the wing, and then loosened the hold of each of its claws alternately till it arrived at the *trochanter,* where it remained fixed. We added three other flies, belonging to the genera *Anthomyia, Sepsis,* and *Borborus.* The first, a much more active insect than the *Lonchæa,* was soon seized by a *Chelifer.* It used its utmost efforts to disengage its *tarsus* without success; however, the *Chelifer* soon relaxed its hold of its own accord. When we looked at the insects the following day, the *Lonchæa,* the *Anthomyia,* and the *Borborus* were alive, and only the first had a *Chelifer* attached to it; so, likewise, had the *Sepsis,* whose death was probably occasioned by confinement not by any wound.

It is regrettable that these observations were not continued; but it is improbable that the behaviour of Chelifers in a bottle would safely represent that of individuals in a state of nature. That the attachment is not merely passive is indicated by the conclusions of Dr. Hess. We have already mentioned that this naturalist watched a house-fly with a Chelifer on one of its legs. He caught the fly at noon on 30th August and put it in a large glass. The Arachnid hung by one pincer to the tibia of the left front leg, the other pincer being free and ready for the fray. Frequently the creature grasped the right front leg with the free pincer; but it was obliged to release it, for the fly spreading out its legs liberated the right one. The two animals were kept for 56 hours without their mutual relations having changed; it merely seemed that the Arachnid had moved a little higher on the leg. To prevent the fly succumbing the observer frequently gave it a drop of milk. It walked about freely, and when resting was usually engaged in attempting to detach the Chelifer, using for this purpose the free front leg which it rubbed against that to which its assailant was hanging. The observation was accidentally terminated on the evening of 1st September, when too much milk was given to the fly, the Chelifer being found drowned on the following morning. It is unfortunate that the observation thus remained incomplete—the leg did not appear to have been injured—but Dr. Hess tells us that in view of the proceedings of the Chelifer, and the obstinacy with which it maintained its position, no doubt remained in his mind that its intention was to attack and feed upon the fly. In all probability the creatures sometimes realise that their chances of causing the insect's death are hopeless; and we have seen that they occasionally detach themselves. That they may be successful, however, seems clear from the observations of Mr. Stainton

and Dr. Lukis, and is proved, I think, by those of Mr. Backhausen now to be quoted. The observations referred to were made in South America, and were reported in 1893 by Professor Berg, who had every confidence in the observer. A fly with a Pseudoscorpion hanging by one pincer to one of its legs was placed under a glass; and after an hour it was observed that the leg to which the Arachnid was attached became stiff. Next morning, Mr. Backhausen found the fly dead and the Pseudoscorpion fat and bloated under some scraps of paper. He next placed ten Pseudoscorpions on a tray with earth and leaves, put them under the glass, left them for a few days without food, and then imprisoned a few small flies. As soon as the Pseudoscorpions perceived the presence of the insects they came out of hiding and began to snatch at them, attaching themselves to their legs, always with one pincer, but using the other in their endeavours to obtain an assured holding. Once fixed they continued to cling to the leg. The observer was somewhat hindered by want of appliances; but according to Professor Berg he established: (1) that the imprisoned leg soon became stiff [this was not the case in Dr. Hess' observation]; (2) that the flies died while the Pseudoscorpions remained on the legs; and (3) that after the flies' death the creatures travelled along the legs to the body, and finally drew the insects under the leaves to suck out their juices. Similar results were obtained with a horse-fly (*Tabanus*); but its death occurred less quickly, as was expected from its greater size. Mr. Reeker, who has also written on this subject, has supported the views derivable from the last-quoted notes. This he does, however, merely on the strength of observations, of little importance, on the behaviour of Pseudoscorpions shut up by him and by Dr. Westhoff with somewhat small flies and beetles. He mentions, among other things, that a gnat (*Culex pipiens*) given to a Chelifer was seized by the leg—the Arachnid would not let go, and next morning the gnat was dead.* Further observations on the lines suggested by those of Dr. Hess and Mr. Backhausen are certainly desirable. The animals should be placed in large cages, the natural conditions of existence being preserved as nearly as possible; and, as pointed out by Dr. Hess, it is important that the insects should be properly supplied with food in order that the contest may have a normal termination.

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* H. Reeker, 'Zur Lebensweise der Afterskorpione,' Jahresbericht des Westfälischen Provinzial-Vereins für Wissenschaft u. Kunst, 1894, pp. 103-8.

Attempts have been made to extend the dispersal theory to Pseudoscorpions associating with beetles. This has been done by Hagen, Moniez, and other writers; and the view has received doubtful support even from Dr. v. Jhering, who was well acquainted with beetle-infesting Chelifers in South America. It is assumed, apparently, that the little Arachnids seek out beetles, manage to effect an entry, and hide themselves away under the wings and elytra for the express purpose of getting a ride. This, as it seems to me, is incredible. It is equally difficult, no doubt, to regard the creatures as predaceous, for they can hardly hope to kill the huge beetles to which they resort. Professor Haldeman, Professor Leydig, Professor Hickson, and other naturalists have supposed them to be parasites, and it is highly probable that they have this character—unless, as might possibly be shown on further observation, they go to the beetles to hunt for infesting mites. Hagen dismisses the idea of parasitism in view of the character of the mouth-parts: 'It is true,' he says, 'that *Chelifer* eats by sucking, but it is very doubtful whether it would choose for its food animals whose segments are very thick.' The segments under the elytra of *Alaus oculatus* and of the great *Acrocinus longimanus,* he adds, 'could never be perforated by the very small and soft maxillary apparatus of the *Chelifer.*' But the writer would not attach much importance to this objection, for much smaller creatures manage to live parasitically on beetles, and we can well imagine that the Chelifers may find weak places in the armour. In the case of an Indian Pseudoscorpion (*Ectocerus helferi*) Stecker has called attention to the formidable character of the mouth-parts, and has supposed them to be suited for piercing the integuments of beetles. He was unacquainted with the habits of the creature, but in a museum-specimen he found a beetle's foot in the mandibles.

SUMMARY.

Of the twenty British Pseudoscorpions, four only have yet been identified from Lincolnshire. They live under bark, stones, etc.; but one was discovered on a fly's leg. The occurrence of the creatures on flies' legs has been reported from various parts of this country; from Austria and Hungary, Germany, Switzerland, Belgium, France, etc.; from North Africa; and from North, South, and Central America. In Europe, the observations are generally made in late summer and autumn, and the Pseudoscorpion is commonly *Chernes nodosus*—a Chelifer about a third of the length of the house-fly. The Chelifers hang to the

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leg by closure of the pincer of one of the pedipalps; their legs, body, and the remaining pedipalp and pincer being free. House-flies are observed on the wing carrying the creatures from place to place, or walking with them on windows, etc. Other encumbered Diptera are seen in gardens, waste-places, etc.; certain small kinds occurring on decaying vegetable matter are specially liable to be attacked; and great Tipulids do not escape. Many infested flies sometimes occur in the same house or about the same rubbish-heap; and not infrequently more than one Chelifer hangs to the same fly. Individuals have been seen carrying two, three, four, five, six, and even eight or ten; and one had four on a single leg. Some Chelifers live in bees'-, ants'-, and termites'-nests; and in South Africa one has been seen hanging to legs of hive-bees. One has been found fossil in amber, in Europe, still on the leg of an ichneumon. In an Austrian grotto, a *Chernes* occurs on a Locustid; while in Germany and England others have been seen on legs of False-Spiders (*Phalangium*). The creatures also occur under the elyta of large beetles. They have thus been seen, singly or in numbers, in North and South America, in Australia, and in the Malay Archipelago. In all these associations it is probable that the creatures pertain mainly to *Chernes*. Those found on beetles are presumably parasitic. Those on legs of flies, etc., have been supposed to have the same character; but the meaning of the phenomena has long been doubtful. When annoyed with a camel's-hair brush, a Chelifer will seize it, and allow itself to be carried away; and, as they are pugnacious, and accustomed to use the pedipalps for attack and defence, the attachment may be accidental. The attached creatures may be carried to considerable distances, for they often hold on tenaciously for a long time. In captivity one maintained its position for fifty-six hours; and they will not always let go when stupefied with ether or plunged into alcohol. We have here, certainly, a means of dispersal—for which an accidental circumstance might possibly have been converted into a special instinct. Moniez maintains that the creatures seize the legs intentionally for the purpose of obtaining a ride; but, from various facts, it seems probable that they have another purpose —and that the usefulness of the habit for dispersal is largely incidental. Most Pseudoscorpions feed on minute insects, which they seize with the pincers. Very small flies, whose legs are seized, are at once overcome. Larger ones lift the assailants from their feet, and carry them away. It is odd that large

creatures should be seized; but *Chernes* is blind and may not always know their size. The Arachnid occasionally effects a lodgment on the body of the living insect, and perhaps sucks its juices; but this is not usual; and it is true that the insects generally appear uninjured. Sometimes, however, they are in an emaciated condition; and according to Stainton's experience Chelifers remain on the legs of house-flies until the latter die. Lukis saw a Chelifer dragging by the legs the carcass of a Dipteron as large as the house-fly. The naturalist who watched a Chelifer and fly for fifty-six hours was convinced that the Chelifer was an assailant; and Backhausen, who kept a number of Chelifers and flies in captivity, is said to have established that the Arachnids remained on the legs till the flies died, and then travelled to the body and sucked its juices. The subject will bear further investigation; but from the facts now in our possession it seems impossible to avoid the conclusion that Pseudoscorpions found on the legs of other Arthropods—often relatively gigantic—are attacking the creatures for food, and that notwithstanding their diminutiveness they are to be regarded, not as parasites, but as animals of prey.

NOTE on NEUROPTERA.

Dragonflies Observed in the Huddersfield District.—On the 28th May I visited Cawthorne, and observed *Agrion puella*, *A. cyathigerum*, and *Libellula quadrimaculata* flitting about in considerable numbers amongst the vegetation of the disused Barnsley Canal.—W. E. L. Wattam, Newsome, Huddersfield, 11th June 1901.

NOTE on HEPATICS.

***Mörckia hibernica* and *Petalophyllum Ralfsii* in Yorkshire.**—On 4th May 1901 I came across the former hepatic (which I have already recorded in 'The Naturalist') with abundant capsules on Coatham Marshes, and in a new habitat. On washing out the gathering, I found several plants of the very rare *Petalophyllum Ralfsii* (Wils.) Gottsche mixed with it. This latter is small, and looks like an outspread fan, with ridges or lamellæ running outwards from the stalk. Mr. Pearson, who has seen it, says this is one of the most important discoveries among the Hepaticæ of recent years. Its previous habitats were Ireland, Cornwall, and Anglesey, so it will be seen it is a very important addition to the Hepatic Flora of Yorkshire.—Wm. Ingham, York, 24th June 1901.

NOTES and NEWS.

'The Girl's Realm' for June 1901 has been sent to us by the publishers, Messrs. Bousfield & Co. Ltd., 10, Norfolk Street, London, W.C., who are not only to be congratulated generally on the excellence of the periodical, but specially on an article by the well-known naturalist-photographer, Mr. R. Kearton, F.Z.S., on 'Birds in their Little Nests,' illustrated by more than a dozen of the admirable photographs taken by Mr. Cherry Kearton, the artist's brother.

NOTES on MOLLUSCA.

Unusually fine *Planorbis nautileus* at Colton, near Leeds.—In the early part of April I was taken by my neighbour, Mr. Smith, to a pond in School Lane, Colton, near Whitkirk. At one end of the pond *Callitriche* grew most luxuriantly, and searching amongst it I found *Planorbis nautileus* very plentiful and more finely grown than I have met with it before, some of them measuring nearly 4 mm. in diameter. Amongst the grass growing round the margin of the pond a few small *Limnæa truncatula* occurred, but, strange to say, there was no trace of *Limnæa peregra*.—WM. NELSON, Crossgates, Leeds, 18th May 1901.

Molluscan Gatherings near Brigg, Linc. N.—Our vicar, the Rev. E. Adrian Woodruffe-Peacock, M.C.S., offered the school children a number of little prizes for the best gatherings of our local species of snails. The result was not satisfactory from the collector's point of view. Hundreds of specimens were gathered, but the species were limited; only a very few being interesting. *Helix aspersa, H. nemoralis,* with a beautiful *compressa* variety and two fair *conica. H. arbustorum* is plentiful here, and the varieties *fuscescens, cincta, flavescens,* and *albina* were taken. *H. cantiana* had also been taken. There was one *H. caperata*, and it was the variety *ornata,* never taken alive in the parish before. There was one *H. rufescens,* and it was the variety *alba,* which was also new. This was strange, as the type and *albo-cincta* are common enough, even in the school garden. The Ancholme river, which was partly run off, supplied *Dreissensia polymorpha* only. Our next gathering will be later in the summer, and it is to be hoped will be more productive.—WM. BOOTH, Howsham School, Lincoln, 13th June 1901.

Reversed *Limnæa peregra* in Leeds.—There is a saying that 'All things come to the man who waits,' and surely there must be some truth in the axiom, for after collecting the Limnæidæ continuously for quite forty years, during which time I must have walked many hundreds of miles, searching the ditches and ponds of our county, and must have passed many thousands of specimens of *Limnæa peregra* through my hands, it was not until the beginning of the present month that I succeeded in finding the reversed form of this species.

During the first week in May I searched a pond situated in North Leeds which I had hitherto altogether overlooked. After searching some time I obtained specimens of the following Limnæidæ:—*Planorbis albus*, moderately fine and common; *Planorbis carinatus*, very fine and common; *Planorbis corneus*, rather fine but very scarce; and *Limnæa stagnalis* var. *fragilis*, very common and appearing to be enjoying itself floating foot upwards on the surface of the water. *Limnæa peregra*, on the other hand, was crawling on the muddy bottom of the shallow side of the pond; they were very fine grown shells of the *ovata* form, and after scooping a sufficient supply out with my net I was just for starting home when, having made what I thought was my last dip, I was at once struck by the singular appearance of one of the specimens, and could scarcely believe my eyes. It was, however, undoubtedly a specimen of monst. *sinistrorsum*. I will not attempt to describe my feelings, which can be readily imagined by any field naturalist who has suddenly found a long-sought-for rarity. After safely boxing my prize, I need scarcely say that I restarted searching with renewed vigour and care, peering into the shallow parts of the pond which the *Limnæa peregra* frequented, and putting every specimen that came within my vision through a critical examination. After a couple of hours' searching I found a few more beauties of the reversed variety.

The only vegetation I noticed in the pond was a grass which grows a considerable length, half of which lies on the water, and one of the water starworts (*Callitriche*).—WM. NELSON, Crossgates, near Leeds, 18th May 1901.

ADDITIONS TO THE RECORDS OF THE YORKSHIRE BOULDER COMMITTEE'S FOURTEENTH YEAR'S REPORT, 1899-1900.

PERCY F. KENDALL, F.G.S., *Chairman*,
AND
J. H. HOWARTH, F.G.S., *Hon. Secretary*.

Owing to the loss of a sheet of the original manuscript, the following records were inadvertently omitted from the Report published in 'The Naturalist' for December 1900, p. 362. They should have come between Mr. Kendall's Hutton Bushell and Mr. Jordan's Gainsborough records.

BOULDER COMMITTEE OF THE HULL GEOLOGICAL SOCIETY.

Reported by Mr. Thos. Sheppard, F.G.S.

Burstwick Gravel Pit, Holderness.

Shap granite, 8 in. × 6 in. ; rhomb-porphyry, 4 in. × 4 in.

Reported by Mr. J. W. Stather, F.G.S.

Atwick. At the foot of cliffs.

Shap granite, 18 in. × 20 in. × 14 in. ; augite-syenite (Laurvikite), 18 in. × 18 in. × 12 in. ; rhomb-porphyry, several pebbles.

Fordon-on-the-Wolds. 250 feet O.D.

Gneiss, 24 in. × 12 in. × 12 in. ; basalt, 30 in. × 24 in. × 24 in., planed on one side ; carboniferous sandstone, 24 in. × 12 in. × 12 in.

Kirk Moorgate, near Robin Hood's Bay. 550 feet O.D.

Rhomb-porphyry, 7 in. × 4 in. × 4 in. ; also two smaller pebbles of same.

Peake, Yorkshire Coast. 600 feet O.D.

In thick glacial gravel, quarry above the railway station ; Shap granite, 18 in. × 15 in. × 12 in. ; rhomb-porphyry, four small boulders.

Runswick Bay.

(1) Shap granite, 30 in. × 24 in., on the beach near the village.
(2) Shap granite, 66 in. × 48 in. × 36 in., on the beach near the village.
(3) Brockram, 12 in. × 8 in.
(4) Magnesian limestone, 60 in. × 48 in. × 36 in.
(5) Shap granite, 24 in. × 24 in. × 18 in.
(6) Shap granite, 48 in. × 36 in.
(7) Shap granite, 36 in. × 48 in.

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This group, with probably many others in the bed of the largest of the four or five becks which run into the Bay.

SPEETON.

Shap granite, 12 in. × 8 in. × 8 in.

STUMP HOWE. Eight miles west of Whitby. 650 feet O.D.

Rhomb porphyry, a pebble.

NOTE on REPTILES.

Ringed Snakes in the County of Durham.—In August 1900 three Ringed Snakes (*Tropidonotus natrix*) were killed in a hayfield near the hamlet of East Butsfield, parish of Satley. Specimens of this reptile are very often seen in this neighbourhood during the summer months.—J. W. FAWCETT, Satley, Darlington, 22nd March 1901.

NOTE on FUNGI.

***Æcidium berberidis* at Gilsland, Cumberland.**—Referring to the Rev. Hilderic Friend's article in 'The Naturalist' for June, on 'Some Lake-land Host-Plants and Parasites,' in which he states that he has not observed or heard of the occurrence of *Æcidium berberidis* in the district, I may say that I have some leaves of the Barberry affected with the parasite which were gathered at Gilsland (18 miles from Carlisle) in June 1892. The hedge in which this Barberry grew has unfortunately been recently removed and a stone wall put in its place. I have also gathered this year at Dalston, five miles from Carlisle, several Barberry leaves bearing spermogonia.—W. THOMSON, 11, Lismore Street, Carlisle, 6th June 1901.

NOTES on BIRDS.

Wheatear Seen at Cadney, near Brigg.—This bird (*Saxicola œnanthe* L.) breeds with us on dry commons in Lincolnshire in a few spots. I was quite surprised to find a pair flitting along the land drain at Cadney, 22nd April 1901, and catching insects on the wing over the water, and with running and a hopping flight on the road by the bank. I have never seen it here before.—E. A. WOODRUFFE-PEACOCK, Cadney, Brigg, 17th June 1901.

Curious Place for Nest of Waterhen, near Horncastle, Lincs. N.—A Water, or Moor, hen (*Gallinula chloropus*), being disturbed on its nest in a pond, took to the nest of a Wood Pigeon in the garden of Roughton Hall, Horncastle. The nest is about 20 yards distant from the pond, in a thorn bush, about 8 feet from the ground. Notwithstanding that lawn tennis is played close by, the bird has laid the remainder of her eggs, seven in number, and is sitting on them. The Wood Pigeon (*Columba palumbus*) had been previously observed sitting in the bush, and had probably hatched her young.—J. CONWAY WALTER, Langton Rectory, Horncastle, 17th June 1901.

Unusual Nesting-place of Starling at Barrow-in Furness.—In the 'Barrow News' of 18th May is a paragraph that while several riggers were at work on the foremast of H.M.S. 'Hogue,' a first-class cruiser, the nest of a Starling (*Sturnus vulgaris*), containing five eggs, was discovered. The nest was built in the swivel which holds the search-light, and a plate had to be removed before the nest could be seen. I may add that at the time the vessel was lying at Ramsden Dock, and that the nest was built about 70 feet above the level of the ship. The vessel has since been removed to the Devonshire Dock, about a mile away, but I have not been able to ascertain whether or not the birds have forsaken the nest or not in consequence.—HARPER GAYTHORPE, Claverton, Prospect Road, Barrow-in-Furness, 1st June 1901.

YORKSHIRE NATURALISTS AT BROUGH.

THOMAS SHEPPARD, F.G.S.,

Curator of the Municipal Museum at Hull;
Secretary of the Hull Scientific and Field Naturalists' Club, and of the Geological Section of the Yorkshire Naturalists' Union.

As so frequently happens on the occasion of the first excursion of the year, not only in the case of the Yorkshire Naturalists' Union, but with almost all societies, there was an exceptionally good attendance of members and associates at the opening excursion of the season at Brough, on Whit-Monday, 27th May 1901, there being nearly eighty persons present, about a dozen of whom spent the week-end in the district. The party was augmented by some students from the Yorkshire College, with Mr. P. F. Kendall, F.G.S., the President-elect of the Union, at their head, who joined the Geological Section. Representatives from seventeen societies answered the roll-call at the meeting; as might be expected, however, a large proportion of the persons present were members of either the Hull Scientific and Field Naturalists' Club, or the Hull Geological Society. This is an agreeable contrast with the state of affairs that existed twenty-four years ago, when 'some naturalists from Hull were expected to join the party' on the occasion of the Union's first visit to Brough.

What was particularly noticeable and gratifying, not only to the officials of the Union, but especially to the members themselves, was the splendid manner in which the various sections were represented. There was scarcely a branch of the Union's work but had its proper official at the Brough excursion. This is as it should be. On many occasions in the past complaint has been made by the members (and not without cause) that the representatives of the sections have not always been present. Persons holding positions in such societies should at least make a point of attending the excursions.

The present year, being the twenty-fifth year of the Yorkshire Naturalists' Union's existence under its present title, the same places that were visited a quarter of a century ago are being revisited, and it is sincerely to be hoped that those members who were fortunate enough to be present at the Brough excursion in 1878, and now, will find evidence of some improvement in the previous state of affairs. This year no particularly grand 'finds,' and few new records, were made. This is probably to

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be accounted for by the manner in which the district has been worked recently by the local societies. Nevertheless, the excursion was a most enjoyable and certainly a profitable one. The glorious weather which prevailed was very acceptable, though to the bryologists and others the recent warm weather was not of the most favourable from their point of view.

The Geological Section (about thirty members) commenced operations at North Ferriby, and was under the guidance of Mr. J. W. Stather, F.G.S., and the writer. The interesting section known as 'Red Cliff,'* on the north bank of the Humber, was first visited. This is perhaps one of the finest sections in a terminal moraine to be met with in the north of England, inasmuch as a complete transverse section is visible, showing the general shape of the mound, as well as its structure and contents. A very similar exposure occurs on the opposite bank of the Humber at South Ferriby, and doubtless at one time the moraine stretched across the estuary, and would have some influence upon the drainage. As the British Association Erratic Blocks Committee, the Yorkshire Boulder Committee, and the East Riding Boulder Committee were well represented on this excursion, it is only natural that much attention was paid to the Scandinavian, Lake District, and other rocks, which occur in the Boulder-clay at this point. The following boulders were noted, and the identification of each confirmed by Mr. Kendall :—

Rhomb-porphyry. From Scandinavia.
Augite-syenite (Laurvikite). From Scandinavia.
Porphyrite. From Dalecarlia, Scandinavia.
Garnetiferous schist. From Scandinavia (probably).
Porphyrite. From the Cheviots.
Armboth Dyke (?). Lake District.
Greywacke
Jaspar.
Lidianstone.
Carboniferous Limestone. From Teesdale.
Magnesian Limestone. From Roker (Sunderland).
Liassic fossils. From Whitby.
Gryphæa dilatata (Kimmeridge Clay).
Pink flint.

*For an account of this and other sections in the district reference should be made to a paper, 'Geology of the neighbourhood of Brough, East Yorkshire" (with Bibliography), by the present writer, which appeared in 'The Naturalist' for May 1901, pp. 129-144.

Black flint.
Red chalk.
White chalk.
Belemnites lanceolata.

The last-named fossil is interesting, as it occurs in fair abundance in the Boulder-clay of East Yorkshire, but so far has not been recorded from the Yorkshire chalk.*

The chalk-pit at 'Melton Bottoms' was next visited, and though the section is of no great size, it is of much importance, inasmuch as it exposes a section in the lower part of the Middle

The 'Black Band' (*Belemnitella plena* zone) in Melton Bottoms Chalk-Pit.
From a Photograph taken during the Excursion by W. S. Parrish.

Chalk (*Inoceramus mytiloides* zone); the 'Black band' or *Belemnitella plena* zone, and the upper part of the Lower Chalk. A few *Inocerami* and other fossils were secured from the chalk, but the attention of the party was principally directed to the dark shales of the *B. plena* bed. Numerous fish scales, a fine fish tooth (probably *Lamna*), *Rhynchonella, Terebratula,* etc., were found, but not the characteristic Belemnite for which so much search has been made in the Yorkshire chalk! The

* See 'The Naturalist,' January 1899, p. 13.

members then walked along the brow of the Wolds, enjoying a glorious view of the Vale of York, through the picturesque village of Welton, to the Mill Hill gravel-pit at Elloughton. This is not worked to any great extent to-day, as the gravel has nearly 'run out.' In the upper local gravel a few small pieces of Roman pottery were obtained. The lower mammaliferous bed was not exposed, but a few pieces of very large bones, probably *Elephas,* were found. In the centre of this pit is a very fine boulder of Augite-syenite—the most westerly record for this rock.* Lower down is the pit in the Kellaways sands, which on a former occasion yielded numerous remains of *Cryptocleidus.* Casts of *Gryphæa bilobata, Belemnites owenii,* and other Kellaways fossils occurred in profusion. In Mr. Prescott's pit, on the low ground towards South Cave, excellent sections in current bedded gravels were seen. These gravels, like the upper gravels on Mill Hill, do not contain mammalian remains. A few days prior to the visit of the Union, a Roman interment had been unearthed in the upper part of this pit. It consisted of a vase, a very fine spear-head of iron, the antler of a Red Deer, much decomposed, and other bones and teeth. With the stupidity which seems to characterise the average British workmen, the vase was broken to pieces, and the fragments scattered in all directions. It was only with the greatest difficulty that a single piece could be found. The spear-head and the deer antler had been taken care of by Mr. Prescott, the owner of the pit, and after showing the members these he was good enough to present them to the Hull Museum. The spear-head, however, had not escaped the fatal curiosity of the workmen. It had been knocked against a cart wheel, and the point was broken off and lost!

At the northern end of Mr. Prescott's pit is a good section showing the gradual change from the solid Millepore Limestone to the gravel, and finally the surface soil. Across a field are the 'Cockle Pits,' where very solid beds of Millepore occur. At this place, which has a pool in the centre, and is surrounded by trees in the best of their foliage, a well-earned rest was taken by the geologists.

The botanists were particularly well catered for, as regards leaders, being under the guidance of Messrs. J. F. Robinson, R. H. Philip, and C. Waterfall, and also officially represented by Messrs. T. W. Woodhead, F.L.S., and J. J. Marshall.

* See 'The Naturalist,' December 1900, p. 356.

Mr. Robinson, who is just completing a 'Flora of the East Riding,' which will be published by the Hull Society, states that as the greater part of the ground in the vicinity of Brough is of a dry, porous character, and as the season has been dry and cold, it was somewhat disappointing to be unable to obtain more of the typical xerophiles (dry-preferring plants). All of importance that were obtained appear in the list below, together with certain hygrophiles (damp-loving) which were obtained in Wold-dale Bottom, and near the 'Cockle Pits' spring between Ellerker and Brough :—

Viola flavicornis. Welton Dale.
Polygala depressa. Welton Dale.
Cerastium semidecandrum. 'Cockle Pits.'
Cerastium arvense. 'Cockle Pits.'
Saponaria officinalis. 'Cockle Pits.'
Astragalus glycyphyllos. Hull Road.
Alchemilla vulgaris var. filicaulis.
Saxifraga granulata.
Valeriana dioica. Wold-dale.
Menyanthes trifoliata.
Atropa Belladonna. Brantingham Dale.
Pedicularis sylvatica.
Daphne Laureola. Brantingham.
Pinguicula vulgaris.
Listera ovata. Wold Woods.
Orchis Morio.
Orchis ustulata.
Orchis latifolia (not 'incarnata').
Eriophorum polystachyon.
Carex dioica (second occurrence in the East Riding).
Carex divisa.
Carex binervis.
Carex stricta.
Carex rostrata.
Brachypodium pinnatum (grass).
Botrychium Lunaria.

The last four of the above-named Carices were brought to the meeting, having been gathered by an advance party who had been botanising nearer the Humber during the week-end.

The recorders for Diatomaceæ (Messrs. M. H. Stiles, of Doncaster, and R. H. Philip, of Hull) report having observed over 70 species in gatherings obtained on this excursion.

Mr. Stiles observes that *Pleurosigma attenuatum,* found by him in a small stream at Ellerker, was shorter and broader than the type form, and approximated to *P. hippocampus. Campylodiscus hibernicus,* found in a drain parallel to the Humber at Brough, differed as to markings from any valve he had yet seen. They consisted of rows of dots instead of costæ, and there was an oblong space in the centre free from markings.

Mr. Philip remarks that in a gathering from a brook at Brantingham, *Gomphonema parvulum* is abundant, and *Synedra ulna* var. *oxyrhyncus* unusually free from admixture of other varieties of *S. ulna.* In a little brook at Brough, *Navicula gastrum* was unusually fine and abundant. In Welton Springs, *Nitzschia Palea* constituted fully 90 per cent. of the total, the remaining 10 per cent. comprising over 20 species.

List of Diatoms found, the heavy figures denoting abundance:

	1 Brough Drain, near Humber.	2 Brough Cockle Pits.	3 Brough Brook.	4 Ellerker Brook.	5 Brantingham Brook.	6 Welton Springs.
Achnanthes linearis	—	—	3	—	—	**6**
Achnanthes lanceolata	—	—	**3**	4	—	—
Achnanthes microcephala	—	—	3	—	—	—
Amphora ovalis	1	—	—	4	5	6
Amphora ovalis var. affinis	—	—	—	4	—	—
Amphora ovalis var. pediculus	—	—	—	—	—	6
Cocconeis placentula	1	—	—	—	—	6
Cocconeis placentula var. lineata	—	2	—	—	—	—
Cocconeis pediculus	—	—	—	—	**5**	—
Campylodiscus Hibernicus	1	—	—	—	—	—
Cyclotella comta var. radiosa	—	—	—	—	—	6
Cymatopleura Solea	—	2	—	4	5	—
Cymbella affinis	—	2	—	—	—	—
Cymbella Cistula	—	2	—	—	—	—
Cymbella cuspidata var. naviculiformis	—	—	—	4	—	6
Cymbella lanceolata	—	—	—	—	—	6
Diatoma elongatum	—	2	—	—	—	6
Diatoma Niemale	—	2	—	—	—	—
Denticula tenuis var. inflata	—	—	3	—	—	**6**
Encyonema cæspitosum	—	—	3	—	—	—
Encyonema ventricosum	—	—	3	—	5	6
Epithemia sorex	1	—	—	—	—	—
Eunotia arcus	—	2	—	—	—	—
Fragilaria capucina	—	—	—	—	—	6
Fragilaria construens	—	—	—	—	—	6
Fragilaria construens var. ventor	—	—	—	—	—	6
Fragilaria mutabilis	—	—	—	—	—	6
Gomphonema constrictum	—	2	3	—	—	—
Gomphonema olivaceum	—	2	3	—	—	—
Gomphonema parvulum	—	—	—	—	**5**	—
Melosira varians	1	—	—	—	—	6
Meridion circulare	—	—	—	—	5	—
Navicula ambigua	—	—	—	4	—	—
Navicula amphisbæna	—	—	3	—	—	—
Navicula cincta	—	—	3	—	5	—
Navicula cuspidata	—	—	3	—	—	—
Navicula cryptocephala	—	—	—	—	5	6
Navicula Gastrum	—	—	**3**	—	—	—
Navicula humilis	—	—	—	4	—	—
Navicula oblonga	—	—	—	—	—	6
Navicula radiosa	1	2	3	4	—	6
Navicula viridula	—	—	—	—	5	—
Nitzschia dissipata	—	—	3	—	—	—
Nitzschia dubia	1	—	—	—	—	—
Nitzschia Hungarica	—	2	—	—	—	—
Nitzschia linearis	—	—	3	—	5	—

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with the co-operation of
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BOOKS RECEIVED.

Chester Society of Nat. Science.—30th Annual Report, for 1900-1. [The Society.
Kansas University Quarterly, Series A, Vol. 9, No. 3, for July 1900. [The University.
North Lonsdale Magazine, Vol. 4, Nos. 5-7, Feb., Ap., June 1901. [Mr. S. L. Petty.
Manchester Geographical Society.—Supplement to Vol. 13, for 1897, published June 1901. [The Society.
Manchester Geog. Soc.—Journ., Vol. 16, Nos. 10-12, Oct.-Dec. 1900. [The Society.
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Journal of Malacology, Vol. 8, No. 2, 29th June 1901. [W. E. Collinge, Editor.
Annals of Scottish Nat. Hist., No. 39, for July 1901. [The Editors, Edinburgh.
Lincolnshire Notes and Queries, Vol. 6, No. 51, for July 1901. [The Editors.
Revue Bryologique, 28e Année, 1901, No. 4, 16e Juli. [M. T. Husnot, Cahan.
Past and Present, successor to N.H.J., No. 208, 15th June 1901. [E. B. Collinson, Ed.
Entomological Society of London.—Transactions, 1901, Part 2, 10th July 1901. [Soc.
Naturæ Novitates, 1901, Nos. 8-11, April-Juni. [Friedländer & Sohn, Publishers.
Geological Magazine, N.S., Dec. 4, Vol. 8, Nos. 444-5, for May-June 1901.
Science Gossip, N.S., Vol. 7, No. 86, for July 1901. [John T. Carrington, Editor.
Knowledge, Vol. 24, No. 189, for July 1901. [H. F. Witherby, Ed., London.
The Zoologist, 4th Series, Vol. 5, No. 721, 15th July 1901. [West, Newman & Co., Publ.
Annotationes Zool. Japonenses, Vol. 3, Pars 4, 30th April 1901. [Zool. Soc. of Tokyo.
Northamptonshire Nat. Hist. Society.—Journal, No. 82, June 1900. [The Society.
American Monthly Micro. Journ., Nos. 239-240, Nov.-Dec. 1899. [C. W. Smiley, Publ.
Hertfordshire Nat. Hist. Soc.—Trans., Vol. 10, Part 8, May 1901. [The Society.
Manchester Lit. and Phil. Soc.—Mem. and Proc., Vol. 45, Pt. 3, July 1901. [Soc.
Ornithologisches Jahrbuch.—Jahrg. 12, Heft 4-5, Juli-Oct. 1901. [Zu Schmidhoffen.
Hobbies, Vol. 10, No. 294, 1st June 1901. [The Publishers.
Nuova Notarisia, Serie XI., pp. 145-end, Ottobre 1900. [Dr. G. B. de Toni, Padova.
Naturalists' Journal, Vol. 9, No. 109, July 1901. [Charles Mosley, Editor.
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Boston Society of Nat. History.—Proceedings, Vol. 29, No. 13, June 1900. [Soc.
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Geography: Notes of Manch. Geog. Soc.—Nos. 58-9, July-Aug. 1901. [The Society.
Psyche: Journ. of Entom., No. 303, for July 1901. [Cambridge Ent. Club, U.S.A.
Entomologists' Record, Vol. 13, Nos. 7-8, 1st and 15th July 1901. [J. W. Tutt, Editor.
The Irish Naturalist, Vol. 10, No. 7, for July 1901. [The Editors, Dublin.
Nature Notes, Vol. 12, No. 139, for July 1901. [Selborne Society, London.
Wm. Whitwell.—Notes of Shells Observed and Collected in East Sussex, 8vo. reprint, July 1901. [Author.
Society for Protection of Birds.—10th Annual Report, for 1900. [The Society.
Darányi Ignácz.—A Madarak Hasznáról és Káráról, 8vo. cloth, 1901. [Ungarische Ornith. Centrale.
Friedrich Goppelsroeder.—Capillaranalyse, etc., 8vo. paper, 1901. [Author.

Lepidium.—I earnestly desire notes of the occurrence of *Lepidium Draba* and *sativum*, and hope to have correspondence from any locality where it occurs. —A. SMITH, 5, Cavendish Street, Grimsby.

	1 Brough Drain, near Humber.	2 Brough, Cockle Pits.	3 Brough Brook.	4 Fillerker Brook.	5 Brantingham Brook.	6 Welton Springs.
Nitzschia Palea	—	—	—	—	—	6
Nitzschia punctata	1	—	—	—	—	—
Nitzschia sigma	1	—	—	—	—	—
Nitzschia Tryblionella	1	—	—	—	—	—
Nitzschia Tryblionella var. levidensis ...	1	—	—	—	—	—
Nitzschia vermicularis	—	—	3	—	—	—
Pinnularia viridis	—	2	—	—	—	—
Pleurosigma acuminatum	—	—	—	—	—	6
Pleurosigma attenuatum	—	—	—	4	—	6
Pleurosigma Spencerii var. Smithii ...	—	—	—	4	—	—
Pleurosigma strigilis	1	—	—	—	—	—
Rhoicosphenia curvata	1	—	3	—	—	—
Stauroneis anceps	—	—	—	—	5	—
Stauroneis Smithii	—	—	—	4	—	—
Surirella minuta	—	—	—	—	5	—
Surirella ovalis	—	—	3	—	—	—
Surirella ovalis var. ovata	1	—	—	—	—	—
Surirella striatula	1	—	—	—	—	—
Synedra radians	—	2	3	—	—	—
Synedra pulchella	1	—	—	—	—	—
Synedra ulna	—	—	3	4	—	—
Synedra ulna var. longissima	1	2	—	—	—	6
Synedra ulna var. oxyrhyncus	—	—	—	—	5	—
Tabellaria flocculosa	1	—	—	—	—	—

All of the above species, however, are included in a 'List of the Diatoms occurring around Hull,' which is being published this year by the Hull Scientific and Field Naturalists' Club. Accompanying the list will be a figure of every species.

With regard to the Mosses, Mr. J. J. Marshall, the Hon. Secretary of the Bryological Committee, writes :—'Owing to the extreme dryness, this meeting was not a favourable one for the collection of mosses, except in the shady parts of Welton Dale. These plants were in such a shrivelled condition that it was almost impossible to distinguish them, and in consequence many have been determined since the excursion. Three collectors gathered 33 mosses and 4 hepatics, all of common distribution in the East Riding and not of sufficient rarity to warrant more than a passing notice. The list, however, is of interest in being representative of the district. *Ditrichum flexicaule,* a limestone-loving species, deserves special mention.' The following is a complete list of the mosses gathered :—

Mollia viridula (L.) Lindb. Ditrichum flexicaule
Ceratodon purpureus (L.) Brid. (Schleich.) Hampe.

Barbula rubella (Hoffm.) Mitt.
Barbula fallax Hedw.
Barbula convoluta Hedw.
Barbula unguiculata (Huds.) Hedw.
Tortula muralis (L.) Hedw.
Tortula subulata (L.) Hedw.
Grimmia apocarpa (L.) Hedw.
Orthotrichum affine Schrad.
Zygodon viridissimus (Dicks.) Brown.
Physcomitrium pyriforme (L.) Brid.
Funaria hygrometrica (L.) Sibth.
Mnium undulatum L.
Mnium hornum L.
Mnium rostratum Schrad.
Atrichum undulatum (L.) Web. Mohr.
Camptothecium lutescens (Huds.) Schp.
Amblystegium filicinum (L.) DeNot.
Amblystegium serpens (L.) Br.Sch.
Hypnum rusciforme Neck.
Hypnum murale Neck.
Hypnum velutinum L.
Hypnum rutabulum L.
Hypnum Swartzii Turn.
Hypnum sericeum L.
Hypnum cuspidatum L.
Hypnum molluscum Hedw.
Hypnum purum L.
Hylocomium splendens Hedw.
Hylocomium triquetrum L.
Hylocomium squarrosum L.

HEPATICS.

Metzgeria furcata.
Radula complanata.
Lophocolea bidentata.
Lophocolea heterophylla.

Opposite the word 'Fungi' on the circular which had been drawn up for the Brough meeting, the words 'No records' appear. It is particularly pleasing, therefore, to find that some mycologists were present at Brough, and Mr. Charles Crossland, F.L.S., has kindly supplied the following notes:—The time of year being early for fungi, and the season so far somewhat dry, the three mycologists (C. Crossland, Halifax; Thomas Gibbs, Sheffield; and R. H. Philip, Hull) were not over expectant about the results of the day's work in their branch. The neighbourhood of Brough and Welton yielded nothing, with the exception of the mycelium of a beautiful blue-green Peziza, known as *Chlorosplenium æruginosum*. A fine beech wood will be worth a visit in September. Not a single Agaric was met with all day. In Elloughton Dale a little swamp was noticed in which a few of the smaller Discomycetes were found on decaying herbaceous stems. A strip of moist larch plantation was next entered. This proved a fairly good place, but, unfortunately the time was too far spent to allow of its being properly investigated; four or five hours would have been quite little enough to devote to it. As it was, sixteen or seventeen of the following 23 species were gathered there:—

Polyporus squamosus Fr. Welton.
Stereum hirsutum Fr. Elloughton Dale.
Lycoperdon pyriforme Schæff. Welton.
Lycoperdon nigrescens Vitt. Welton.
The two preceding were remains of last year's production.
Uromyces poæ Rabh.
Æcidiospores on Ran. ficaria. Brough and Elloughton Dale.
Uromyces alchemillæ (Pers.).
Uredospores on Alchemilla vulgaris. Elloughton Dale.

Puccinia rubigovera (DC.) Early Uredo stage on Holcus mollis. Elloughton Dale.
Puccinia hieracii (Schum.). On Leontodon. Brough.
Puccinia suaveolens (Pers.). Early stage on Carduus arvensis. Elloughton Dale.
Phragmidium subcorticatum (Schrank). On Rosa canina. Elloughton Dale.
Phragmidium sanguisorba (DC). Early stage on Poterium sanguisorba. Elloughton Dale.
Triphragmium ulmariæ (Schum.). Uredo stage on Spiræa ulmaria. Elloughton Dale.
Chlorosplenium æruginosum (Œd.) DeNot. Welton. Mycelium only.
Lachnea scutellata (L.) Gill. Elloughton Dale.
Dasyscypha virginea (Batsch.). Elloughton Dale.
Dasyscypha nivea (Hedw.) Mass. Elloughton Dale.
Dasyscypha dematicola B.&Br. Elloughton Dale.
Dasyscypha hyalina (Pers.) Mass. Elloughton Dale.
Helotium cyathoideum (Bull.) Karst. Elloughton Dale.
Mollisia cinerea (Batsch.). Elloughton Dale.
Orbilia leucostigma Fr. Elloughton Dale.
Sphæria pulvis-pyrius Pers. Elloughton Dale.
Stemonites Friesiana DeBary. Elloughton Dale.

Two species gathered on this excursion were forwarded to Mr. Massee for identification; one proves to be *Tapesia fusca* var. *rosæ*, and was found on dead stems of the rose. The other is *Mollisia cinerescens* Rehm., and is new to Britain. Unfortunately Mr. Crossland could not make out what the latter was growing upon.

The entomologists were favoured with the presence of their President, Mr. Geo. T. Porritt, F.L.S., F.E.S., and Secretary for Coleoptera, Mr. E. G. Bayford.

Respecting the Coleoptera, Mr. Bayford writes:—'Subjoined is as full a list as I am able to send now. I have a few species yet to identify which may take some time. There is only one species in the lot which calls for any special mention, viz., *Hedobia imperialis* L., a species I had not before met with, although recorded from Scarborough. It was taken by Mr. Tunstall while beating, and given to me as I left the table to catch my train. It was amongst several beetles which he had had the kindness to put into a box I had given him early on in the day. The incident serves to show how much real assistance may be given to each other by the members of various sections. As to the district, etc., they may be summed up as follows—Day, fine; locality, promising; result, disappointing!'

List of Coleoptera collected at Brough:—

Harpalus ruficornis F.
Nebria brevicollis F.
Bembidium 4-guttatum F.
Bembidium minimum F. Only one record for Yorkshire. 'N.E. Eston in Cleveland (W. Hey).'

Bembidium lampros Herbst.
Bembidium æneum Germ.
Laccobius sinuatus Mots. Recorded with certainty only from 'Central. Askham Bog (W. Hey, etc.).'
Sphæridium bipustulatum F. v. marginatum F. Not yet recorded from S.E. Yorks..
Tachyporus chrysomelinus L.
Baptolinus alternans Grav. Not yet recorded from S.E. Yorks.
N.B.—The Yorkshire list is only published to end of Staphylinidæ.
Coccinella 7-punctata L.
Coccinella 10-punctata L.
Adalia obliterata L.
Halyzia 14-guttata L.
Elmis æneus Müll.
Melanophthalma gibbosa Herbst.
Silpha atrata L.
Sinodendron cylindricum L.
Melanotus rufipes Herbst.
Athous hæmorrhoidalis F.
Helodes minuta L.
Telephorus lituratus F.
Hedobia imperialis L.
Chrysomela staphylea L.
Phyllotreta nemorum L.
Plectroscelis concinna Marsh.
Pyrochroa serraticornis Scop.
Apion pallipes Kirby.
Otiorrhynchus picipes F.
Phyllobius argentatus L.

Mr. G. T. Porritt, F.L.S., gives the following list of noteworthy Hemiptera, Trichoptera, and Orthoptera collected on the excursion:—

Hemerobius atrifrons.
Limnophilus affinis.
Agapetus fuscipes. (In abundance in a ditch near Brough, and a welcome and much-needed confirmation of the species as a Yorkshire insect.)
Labia minor.

For the conchologists, Mr. J. E. Crowther, the Secretary of the section, writes that amongst the conchologists present were Messrs. J. W. Taylor, F.L.S. (President of the section); W. Cash, F.G.S.; W. Denison Roebuck, F.L.S., and J. E. Crowther (Secretary). In a stream on the way to Welton, *Ancylus fluviatilis* was taken, and *Planorbis albus* and *Pisidium pusillum* from the stream at Welton village. Proceeding up Welton Dale, *Clausilia laminata, Pupa cylindracea, Arion minimus,* and many others were found in the beech woods. At the head of Welton Dale, *Helix hortensis, H. itala,* and *H. caperata* were obtained from an old chalk pit. At Brantinghamthorpe, *Limnæa truncatula* and *Pisidium pusillum* were taken in the stream, and higher up the dale, *Bulimus obscurus* and *Cochlicopa lubrica.* At this point the conchologists found themselves so much in the rear of the rest of the party that they decided to turn back and work down the dale towards Brough, and here *Hyalinia crystallina* and *H. pura* were turned up. The most interesting 'find' of the day was in the form of a couple of specimens of that fine slug, *Limax cinereo-niger,* which is probably the *maximus* of Linné, as our *maximus* is not to be found in Sweden. After this *Helix cantiana* was the only

other addition on the way to Brough. A walk on the Humber foreshore after tea resulted in *Helix nemoralis* with its variety *minor* being found in some numbers. Altogether during the day 33 species were noted, this total being made up of 6 slugs, 21 land shells, and 6 freshwater species. Considering the extreme dryness and the absence of ponds and ditches on the routes taken, this must be accounted very fair. The following is a complete list of the species noted :—

Arion ater.
Arion minimus.
Arion hortensis.
Arion circumscriptus.
Limax cinereo-niger.
Agriolimax agrestis.
Vitrina pellucida.
Hyalinia cellaria.
Hyalinia alliaria.
Hyalinia nitidula.
Hyalinia pura.
Hyalinia crystallina.
Hyallinia fulva.
Helix rotundata.
Helix aspersa.
Helix nemoralis.
Helix hortensis.
Helix cantiana.
Helix hispida.
Helix itala.
Helix caperata.
Buliminus obscurus.
Pupa cylindracea.
Clausilia perversa.
Clausilia laminata.
Cochlicopa lubrica.
Carychium minimum.
Planorbis albus.
Limnæa peregra.
Limnæa truncatula.
Ancylus fluviatilis.
Pisidium fontinale.
Pisidium pusillum.

It will be seen from the foregoing reports that much good work was accomplished. The weather during the excursion was all that could possibly be desired. May many of us meet again on the same ground twenty-five years hence !

NOTES on FLOWERING PLANTS.

***Myosurus minimus* near Grantham.**—On the 20th of May 1901 I came across several plants of Mousetail (*Myosurus minimus*, L.) growing on the top of a pond-bank in a pasture in the parish of Brandon, Div. 15. I had not seen it growing before, and there were quite a number of plants. —S. C. Stow, Court Leys, Brandon, Grantham, 21st June 1901.

Plant Names: Howsham, near Brigg.—Superstitions are not yet dead with us, as the following will prove :—On the 25th of April a child brought to the day school at Howsham an early flower of *Anthriscus sylvestris* Hoffm. On inquiry I found that the children themselves knew this species by the local names, 'Humlock, Hemlock, Rabbit-meat, and Mother-die.' This latter was from a girl. The first three names are common and easily explained ; 'Mother-die' is just as remarkable. 'What a strange name !' I said ; 'however does it happen to have such a name?' This elicited a reply to the effect that if girls take the flower into the house, and their mother smells it, she will die. Asked if they meant she would die suddenly or within any certain time, they said they did not know. Whether this piece of folklore is widespread or only quite local I am unable to say, for I have never heard of it before.—Wm. Booth, Howsham School, North Lincoln, 14th June 1901.

NOTES on YORKSHIRE BIRDS.

Holderness Bird-Notes, Easter 1901.—Up to the end of March the only migrant noted at Aldborough was the Pied Wagtail (*Motacilla lugubris*). At Saltend, on the Humber Bank, two Wheatears (*Saxicola œnanthe*) were seen 5th April; and one Yellow Wagtail (*Motacilla raii*) 15th April. This Wagtail was still the only representative of the usual flock, on 20th April, my last visit. Two Swallows (*Hirundo rustica*) were observed travelling north over Saltend on this date. Of winter migrants, flocks of Golden Plover (*Charadrius pluvialis*) were seen at Cherry Cob Sands, 9th April, and Flinton, 15th April; Fieldfares (*Turdus pilaris*), Rose Hill, 9th April; Selley, 17th April; Curlew (*Numenius arquata*), Saltend, 15th April (over 100); 18th April; large flock of Stint (*Tringa alpina*), Saltend, 7th-20th April.

Ring Plover (*Ægialitis hiaticula*) were still in flock 20th April.

The stoppage of the East Hull shipbuilding yards has been disastrous to the Lapwing (*Vanellus vanellus*) and Redshank (*Totanus calidris*) on Saltend Common. Six egg-hunters at once was a frequent occurrence.—T. Petch, Hedon, Hull, 18th May 1901.

Cuckoo and Meadow-Pipit, Halifax.—I found a Meadow Pipit (*Anthus pratensis*)'s nest in a depression shaded by bilberry stalks in a bank by the side of the road on Saltonstall Moor. There were four eggs in it, three Meadow Pipit's and one Cuckoo's. The Cuckoo was hatched on 6th July, and by the day following the other three eggs had been thrown out of the nest and broken. Whether this was the work of the young Cuckoo, the Meadow Pipits, or the old Cuckoo I cannot say. I visited the nest yesterday (14th July) and the young Cuckoo is now, as the country people say, in 'blue pane,' i.e., its feathers are mostly in the quill stage. Already the young bird completely fills the nest and is almost twice the size of its foster parents. In colour it is black, and does not yet appear to have any voice, for it never utters a sound, not even when being fed. The old Cuckoo still keeps to the district and can frequently be seen flying about, the hen always followed by a train of eight or ten small birds. I visited the Meadow Pipit's nest again on 23rd July, but found it empty and the old birds gone. A farmer's boy informed me that some boys found it on Monday, the day after I last visited it, and killed the young Cuckoo. I was so sorry for I wanted to see it through.—Harold Pickles, 137, Hyde Park Road, Halifax, 27th July 1901.

Habits of Bearded Reedling at Hornsea.—On the 28th of June, when amongst the reeds and rushes by the side of Hornsea Mere, my attention was arrested by a soft musical tweet, which was new to me; I pushed through the rank vegetation, which was several feet higher than myself, getting my feet unpleasantly saturated with the black-green ooze which rushed over my boot tops at every step, but was unable to get more than a passing glance of some small birds which were flitting amongst the tall reeds, etc. Eventually I climbed into a stunted, lichen-clad tree, and, after remaining perfectly still for some time, I was rewarded by seeing a pair of old Bearded Reedlings (*Panurus biarmicus*) or Bearded Tits, as they are still generally called, and at least three young ones. As the young were strong on the wing and had evidently been flying for some time, it is possible they may have come some distance, but I think it is more probable they had been bred in the immediate neighbourhood. I watched them for ten minutes or more, the soft rich colouring, especially of the old male, blending beautifully with the light green of the reeds and grasses by which they were surrounded. They were shy, retiring quickly down amongst the plants when alarmed, but still they did not seem to be particularly wild, as they came quite near to me.

I should have watched them longer, but, unfortunately, my perch broke and I went plump down amongst the slime. When I struggled out my person was anything but pleasant to look upon and very offensive to the olfactory organs.—K. McLean, Harrogate, 20th July 1901.

NOTES on YORKSHIRE PLANTS.

Plants Noted near Leeds and Cawthorne.—During a walk through the Gorge in Roundhay Park, Leeds, on the 19th May, I found a pink blossom of *Anemone nemorosa*, and in the afternoon of the same day I was taking a stroll in the neighbourhood of Allwoodley Gates and came across a plant of *Aquilegia vulgaris* in bloom by the roadside.

On the 28th May, the most prominent plants noted in bloom near Cawthorne were *Equisetum palustre*, *E. limosum*, *Carex elongata*, and *C. axillaris*. —W. E. L. WATTAM, Newsome, Huddersfield, 11th June 1901.

***Geranium pyrenaicum* at Campsall, near Doncaster.**—The confirming of old records being as interesting as the establishment of new, I write to say that on the occasion of the Doncaster Scientific Society's visit to Campsall, on the 13th inst., *Geranium pyrenaicum* was found in profusion on a grassy bank in Campsmount Park. The only record for the Don basin in Lees' West Yorkshire Flora is 'Roadside between Campsall and Barnsdale; E. Lankester (1842).'—H. H. CORBETT, Doncaster, 14th June 1901.

Danewort in Mid-Wharfedale, Yorkshire.—On 4th July I had the pleasure of adding a new species to the flora of Wharfedale—new to 'the books' which, after all, can but register What is when they are builded, yet probably old as the Tudor farmsteads, or even much more ancient still. Paying a pop visit to the old Manor House at Castley, east of the N.E.R. viaduct, I was pleased to observe a quantity of *Sambucus Ebulus* against the wall at the back in the house-close of the building, falling to decay and now uninhabited, save by strolling members of an art fraternity. To me it was a suggestive and unexpected 'find,' as it fills up a gap in the line of its distribution, the nearest stations in which I have seen it of late years being Leckby, north of Boroughbridge, and Liversedge in the Spen Valley, where it was probably artificially adventive. An hour earlier I had gathered the Norman Garlic (*Allium arenarium*) by the Wharfe side at Rougemont (the site of an ancient moated castle of the DeLisles) two miles nearer Harewood. The Garlic grew where the Weeton Beck, utilised as an outer moat, joined the crescentic reach that formed the impregnable base of the Norman stronghold's south side. This Garlic was used as a pot herb—is to this day. But as to the Dane's Elder, place names ending in 'by'—as Leckby, Wetherby, Maltby—are said to indicate Danish occupation or origin; and this 'local habitation' and the railway station at Weeton are within the boundary of Huby hamlet or township. Such names are not nearly so common in W.R. York as in the Eastern Counties, and the Danewort expectably less frequent likewise. This growing of a plant the Danish invaders brought with them is rather a survival than a true Change of flora. Some recent disturbing of the soil at Castley had probably brought within the subtle influence of light, air, and the right temperature for germination, the seeds of the mediæval herb—there was Gout-weed in plenty near hand, too—but whatever the probably-many causes, I find corroborative evidence (and for the West Riding, too, in Sherburn barony) in the curious fact germed in a recital of how, in A.D. 1307, one John Eyton obtained from the Ecclesiastical authorities of his day, 'a Licence to hold Divine Service' in his private chapel, 'a decent oratory' as he submits, 'within his manor of Lennerton,' . . . 'which manor is much distant from the Parish Church' of Sherburn, 'and oftentimes by the rising of the water, and other impediments, he and his household cannot safely attend at the parish church." Showeth this, how the locality has completely changed, the flood-ridden area now sun-bathed cornland and potato-broad, with the Bishop's dyke on occasion amply capacious enough to carry off the most copious drench of Jupiter Pluvius! The only remains of the old condition of the surface are, I think, the undrained peat-over-sand lowland about Askham and Askern, and the marshy 'rein'-land or 'rhine'-land* about Gateforth. (**Rein* and *Rhine* = a brook, a watercourse, a narrow dike.)—F. ARNOLD LEES, Meanwood Lodge, Leeds, 8th July 1901.

NOTES on LINCOLNSHIRE MOLLUSCA.

***Pisidium milium* at Revesby, Lincs.**—On 4th July, on the occasion of the meeting of Lincs. Naturalists' Union at Revesby I found *Pisidium milium* in a pond near the reservoir; its identification has been kindly verified for me by Mr. Lionel E. Adams.—C. S. CARTER, 172, Eastgate, Louth, Lincs., 11th July 1901.

***Helix cantiana*: Its Range and Soil Preferences in North Lincolnshire.**—All explanations which I have yet met with about the dispersal of *H. cantiana* are not according to the facts I can observe in N. Lincs. in a short walk. The Rev. J. W. Horsley once pointed out by letter that snails are rare on sandy inland soils, though plentiful enough on sea-side sandhills which contain much comminuted lime from the destruction of sea shells. He added: 'I have also a theory that proximity to highroads leads to their greater abundance, since they get their material for their shells in a powdered and easily assimilated form. I should certainly expect more booty in the hedge of a field lying by a road than in the other three hedges length for length. This may be due to a certain extent to the greater absence of their enemies near to a line of traffic.' This I find to be true generally, but there are most peculiar exceptions. *Helix cantiana* on the sandhill on to which the outfall of the Thirty Foot Drain at Cadney abuts is as fine as can be taken in any part of England. This hill is made up of drift sandy gravel from chalk and Kellaways Rock. Absent on the peat between, at Hibaldstow on the whole length of the cornbrash outcrop they are fine and plentiful. While right on the Kirton Beds of the Lincolnshire Limestone, with 70·85 percentage of $CaCO_3$, for long distances not a single specimen can be found on the old Roman road from London to Barton-on-Humber. Just west again, on the same stratum, they are not uncommon on the Cliff Road on the same geological bed, though the specimens are not so fine. In other ways the actions of our molluscs are most puzzling. *H. virgata* here at any rate may be found abroad in frost and snow on its beloved spots. It seems to be indifferent to seasons and weather when it likes. But of the hundreds I have sown in botanically 'fitting' localities not a single specimen remains; and yet the range of this species is wide and as inexplicable as it well can be. My present means of explanation fails with the commonest species. *H. nemoralis* is found on every bank and hedge-side, and here and there abounds. On the 13th of April I took a ten miles' stroll in the rain on the look out for anything to be seen. Not a single specimen of *H. nemoralis* did I see except for two hundred yards on the Kirton Beds, where it was out by scores, young and old together, and most active. Yet dead shells, which were visible everywhere by the road-side, showed it was not uncommon on the whole route I went. The explanation cannot be merely a question of food. All the shells were on the branches of White Thorn (*Cratægus monogyna* Jacq.) which had been recently cut from a laid hedge and placed in a very shallow ditch to keep off cattle. The difficulty is they were not feeding on the thorn bark, and the other herbage was no higher, as far as I could observe, than in other places, where a similar protection had been placed a year and two years before. The drain and bank faced the wind and cold rain, and I passed a hundred spots more sheltered and there was not a snail out. On the 14th I observed the same thing. In a two miles' walk not a snail was out except for about sixty yards on a bank. There their chief resting plant was the Barren Brome (*Brachypodium pinnatum* Beauv.). On the 12th *H. cantiana* was out in the bitterest east wind, but only in a few sheltered spots. There is much in the life of slugs and snails that the wisest conchologist dreams not of as yet. All notes on the food plants, soils, frequency and scarcity of molluscs and their varieties are most interesting to me, if brother naturalists would kindly communicate them by letter.—E. ADRIAN WOODRUFFE-PEACOCK, Cadney, Brigg, 16th April 1901.

[Such notes as Mr. Peacock suggests in his concluding remarks will be most acceptable at all times for publication in this journal.—EDS. Nat.]

NOTES ON THE SKELETON OF SIBBALD'S RORQUAL IN THE HULL MUSEUM.

THOMAS SHEPPARD, F.G.S.,

Curator of the Municipal Museum at Hull;

Secretary of the Hull Scientific and Field Naturalists' Club, and of the Geological Section of the Yorkshire Naturalists' Union.

The skeleton of the Whale, which for many years has formed the chief attraction in the Museum of the Literary and Philosophical Society at Hull, now taken over by the Corporation, is a specimen of the greatest possible interest and scientific value. It is not a Whale of the ordinary type by any means, having many striking differences, which are of such importance that they have been sufficient to indicate a species not previously described, and the name first given to it was *Physalus* (*Rorqualus*) *sibbaldii* Gray.

The animal was washed up near the mouth of the Humber in 1835, and measured 55 feet in length when found. The length of the skeleton is 47½ feet; its head is 10½ feet long; it has 64 vertebræ, and 32 ribs. The upper jaws contain 580 fanons or 'whalebones.' Examples of the same species have since been found as much as 80 or even 85 feet long, this being the maximum length attained by any animal.

The first description of the specimen that the writer has been able to trace appears from the pen of Dr. J. E. Gray, F.R.S., a recognised authority on the *Cetacea*. This is in a paper 'On the Finner Whales, with the Description of a New Species,' which was read to the Zoological Society of London on the 8th of June 1847, and is printed in that Society's 'Proceedings,' Part 15, for 1847, pp. 88-93. Dr. Gray points out that Whales differ greatly from one another in the degree of mobility of the neck, as is well shown in the union or separation of the cervical vertebræ, and in the variations in the development of the lateral and spinose processes of these neck vertebræ. In the Whale in the Hull Museum all the cervical, or neck vertebræ are well developed and separate one from another. In certain species of Whales (small examples of some of which, e.g., the Bottle Nose Whale, *Hyperoodon rostratus* Bell, are represented in the Hull collection) all the cervical vertebræ are united and form practically one bone. This union of the bones appears to take place at an early period in the life of the animal, as is shown by the skeletons of very young individuals. Dr. Gray's

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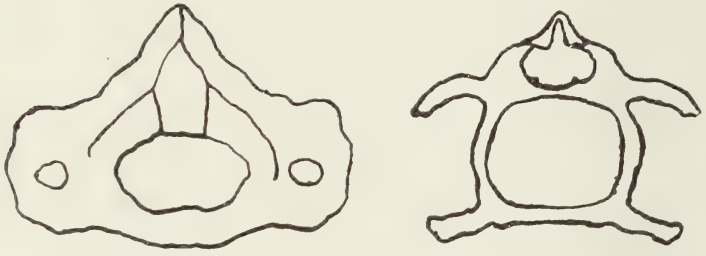
description of the distinctive characters of the Hull skeleton is as follows:—'The transverse apophyses of the second cervical vertebra rather elongated, united, leaving only a small subcentral hole; of the other cervical vetebræ slender, shorter and far apart, nearly straight, directed out laterally.' He then points out that the Hull specimen 'has 64 vertebræ, as follows: cervical, 7; thoracic, 16; lumbar and caudal, 41; and the arms and paddles are 6 feet 9 inches long; the ribs 16 pair, all simple. The baleen is black.'

In 1864 the same author read a paper of 54 pages to the Zoological Society 'On the Cetacea which have been observed in the Seas surrounding the British Islands.' It is here pointed out that the second cervical vertebra of the Hull skeleton 'has



Second and fifth cervical vertebræ of Balænoptera sibbaldii (after Harrison.)

a broad lateral expansion, and is oblong, obliquely truncated from the wide upper to the narrow lower edge, and with a small oblong subcentral perforation near the base; the third, fourth, fifth, sixth, and seventh cervical vertebræ have a straight, rather elongate lateral process, which projects straight out from the body of the vertebra, and the upper and lower ones are of nearly equal length. The end of the first rib, near the vertebra, has a single head; and the second rib has a compressed internal process.'

Early in 1865, Professor W. H. Flower, F.R.S. (who, just prior to his recent death, had done so much in exhibiting the specimens in the new Whale Room connected with the British Museum), visited Hull, and on 13th June of the same year

read a paper to the London Zoological Society 'On *Physalus sibbaldii* Gray.' This is printed in the Society's 'Proceedings,' for 1865, pp. 472-474. Professor Flower agrees with Gray in regarding the Hull skeleton as a distinct species, and he points out that it coincides precisely with a specimen which had then recently been acquired by the trustees of the British Museum, from the collection of the late Professor Lidth de Jeude, of Utrecht, to which Flower had given the name of *Physalus latirostris,* but he withdrew this name in favour of the one previously given by Gray to the Hull specimen. Flower goes on to say: 'The Hull and the Utrecht skeletons are at nearly the same stage of growth; the epiphyses are disunited in almost all the vertebræ, as well as on both ends of the humerus, radius, and ulna. In the Hull specimen the ossification of the transverse process of the second cervical vertebra has proceeded so far as to surround the vertebral foramen; in the Utrecht skeleton the foramen is still open, though only by a narrow fissure on one side. I should judge from this that the former is rather the older of the two. In both, the transverse processes of all the remaining cervical vertebræ are incompletely ossified, and not united at their ends by bone. In general size and proportions the two specimens very nearly correspond, the advantage being in favour of the Hull one, which is stated to have a total length of 47 feet, the cranium being 10 feet 6 inches, while the Utrecht specimen is about 43 or 44 feet long, the skull being 9 feet 10 inches. Either example, when full grown, would probably be not far short of 60 feet, or somewhat less than the average size of the common species.'

'The two skeletons agree in possessing 64 vertebræ, both being in this respect, fortunately, complete. In *P. antiquorum* [another species] the number never appears to exceed 62. In the Hull skeleton the foramen in the transverse process of the axis is very small, and nearly circular, about 2 inches in diameter. In the Utrecht specimen it is more oval, 3¼ inches high, and 4¼ inches long. This difference in so variable a part is probably only individual. The four following vertebræ have in both a converging upper and lower process, which are, as said before, incomplete and ununited. In the Hull specimen the seventh has a short but distinct inferior process, which in that at Utrecht is represented by a mere tubercle. In the terminal caudal vertebræ there is a great similarity; the last is very small, short, and disc-like; the second from the end is of similar form, but somewhat larger; the third presents a sudden increase

of size in every direction, so marked that, if it did not occur in both skeletons, one might easily suppose that a bone had been lost from this region.'

'The principal peculiarity of the skull, which was pointed out in the Utrecht specimen, was the breadth of the rostral portion; this is repeated, though to not quite the same extent, in the Hull skeleton. The breadth across the middle of the beak of the former is to the length of the skull as 27 to 100, in the latter as 26 to 100. In six specimens of *P. antiquorum* it varies between 18 and 21 to 100. The actual breadth (measured across the upper surface following the curve) in the Hull specimen is 33 inches, each maxillary being 10 inches and the premaxillary 5 inches, the space between the latter 3 inches. The nasal bones agree together, and differ from *P. antiquorum* in being but slightly hollowed on their upper surface and anterior margins. This character is most strongly marked in the Hull specimen.'

'The *stylo-hyals* are thicker, especially near the lower end, in both the Utrecht and Hull skeletons than in the common Fin-Whale.'

'The sternum, which is so remarkable in the Utrecht specimen for its almost rudimentary state, is, unfortunately, wanting in the Hull skeleton; but even this absence may not be without significance, for if it had been a large, well-developed bone, it is most unlikely that it should have been lost in a skeleton prepared with such care as to be in every other respect perfect.'

'In the Utrecht skeleton (not articulated) there appear to be but fifteen pairs; while in that at Hull there are sixteen, the last well developed—as long, in fact, as those which precede it. If one could be certain that one had not been lost in the former case, this difference might be of some importance; but in different specimens of *P. antiquorum* the last rib is in some completely developed, and in others represented by a mere splint of bone totally unconnected with the vertebral column, and therefore easily overlooked in preparing the skeleton. If sixteen is the normal number of the pairs of ribs in *P. sibbaldii*, this makes a good specific distinction from *P. antiquorum*, which has never been known to have more than fifteen. The first rib agrees in both specimens, and differs in *P. antiquorum* in wanting a well-developed capitular process. In the Utrecht specimen this process is present in the second, third, and fourth ribs—longest in the third. In the Hull skeleton it is found from the second to the sixth, being longest in the third and fourth. In

P. antiquorum it is usually longest in the second, and obsolete in the fourth.'

'The phalanges of the digits of both skeletons are articulated artificially, and yet they correspond exactly in number and arrangement, except that the Hull specimen has an additional bone on digit III. The numbers are:—II., 4; III., 5 (Utrecht), 6 (Hull); IV., 5; V., 3—an arrangement differing somewhat from that of *P. antiquorum*. But one of the most striking and characteristic differences in this part of the skeleton is the greater length of the metacarpal bones and phalanges, which in both the Hull and Utrecht specimens, not only relatively but even actually, exceed those of the full-grown *P. antiquorum*, 70 feet in length.'

'The baleen [or 'whalebone'] is not preserved in the Utrecht specimen; but in the Hull skeleton it is in excellent condition, and shows a striking difference from that of the common species in being of a uniform deep black, instead of dark olive-brown or horn colour, variegated towards the ends of the series with patches and stripes of a lighter colour.'

It will be seen from the above quotations that Professor Flower most carefully compared the two skeletons of *Physalus sibbaldii* then known, and found many striking points of resemblance.

In the year following Professor Flower's visit to Hull (i.e., in 1866), the second edition of the 'Catalogue of Seals and Whales in the British Museum,' by Dr. Gray, was published. It contains (on page 160) a very similar account of the Hull skeleton to that previously given by Dr. Gray, referred to at the commencement of these notes. This Catalogue is also illustrated by Mr. Harrison's two drawings of the cervical vertebræ. The following additional information, however, is supplied:—'The lower jaw strong, with a conical, large, well-developed ramus. . . . Breast bone wanting. . . . The articulating surfaces of the cervical vertebræ are oblong, transverse, much broader than high.' In reference to this it should be stated that a model of the sternum, or breast bone, as nearly accurate as can be estimated, appears in place of the missing one, in the Hull skeleton. Accompanying Dr. Gray's description is the following note, signed 'R. Harrison,' of Hull:—'The form of the head is much like that of Ravin's figure of the skull of *P. antiquorum*. It is 10 feet 10 inches long, 4 feet 8 inches wide at the orbits, and 2 feet 9 inches wide at the base of the beak. The lower jaw is 9 feet 8 inches long without allowing for the curves.'

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At the end of this edition of Gray's Catalogue are several pages of 'additions and corrections,' amongst which a reference to the Hull skeleton occurs. It appears that the name is to be changed from *Physalus sibbaldii* to *Cuvierius sibbaldii*, the genus *Cuvierius* being intermediate between the genus *Physalus* and the genus *Sibbaldius*; it being characterised by the broad rostrum of the latter and the vertebræ and ribs of the former, and a peculiar sternum.

The next paper of importance that I have been able to find dealing with the Hull skeleton is by Professor (now Sir) William Turner, F.R.S., etc., who was President of the British Association meeting at Bradford last year. It is 'An account of the Great Finner Whale (*Balænoptera sibbaldii*), stranded at Longniddry,' on the Firth of Forth, which is published in Vol. 26 of the Transactions of the Royal Society of Edinburgh (1870). The author refers to the changes made in the name by Messrs. Gray and Flower, and adds that 'those zoologists who do not break up the great genus *Balænoptera* into several smaller sub-genera [amongst whom presumably Sir Wm. Turner is to be included] prefer to call the animal *Balænoptera sibbaldii*.' This paper is most interesting and valuable, inasmuch as it contains a detailed description of the external appearance as well as of the soft parts of the same species of Whale that is preserved in the Hull Museum.*

Professor Turner refers to an important memoir published in 1867 by Professor Reinhardt, in which 'it was clearly established that a well-defined species of Finner exists in the northern seas, which differs from the common Razor-back, in possessing a greater number of vertebræ, a broader beak to the cranium, a greyish and not a whitish belly, and a uniform black baleen, instead of one mottled with various tints. In the distribution of the tints of the skin, in the uniform black colour of the baleen, and in the length of the animal, the Steypireythr [of the Icelanders] obviously closely corresponds with the Longniddry Whale. But what is even more important for the determination of the species, the cranium, atlas, and hyoid, as far as one can judge from Reinhardt's figures, are almost identical in form with the corresponding bones in the Longniddry Whale. Hence we arrive at the conclusion that the Longniddry Whale is a specimen of the *Balænoptera sibbaldii*, or *Physalus sibbaldii* of

*A paper by Sir William Turner, giving an account of the sternum and pelvic bones of this skeleton, appears in the Journal of Anat. and Physiol., Vol. 4, 1870.

Gray. . . . The comparison now made between these different specimens of Finners leads to the conclusion that the following should be referred to the *Balænoptera sibbaldii*:—The North Berwick Whale, the Hull skeleton, the Utrecht skeleton, now in the British Museum, the Gothenburg Whale, the Steypireythr, the Longniddry Whale, and, in all probability, the Ostend Whale, and Sibbald's 'Balæna tripinnis quæ maxillam inferiorem rotundam, et superiore multo latiorem habuit.'

In the second edition of Bell's 'British Quadrupeds' (1874), p. 402; in Southwell's 'British Seals and Whales' (1881), p. 75, in Flower's 'List of the Cetacea in the British Museum' (1885), p. 6; and in Flower and Lydekker's 'Introduction to the Study of Mammals' (1891), p. 243, the name of *Balænoptera sibbaldii* is maintained, and, as these are recognised and standard works, it may be taken that this is the name by which the Hull skeleton is to be known.

In Flower and Lydekker's 'Introduction to the Study of Mammals' (1891), p. 242, the general characteristics of the genus *Balænoptera* are given, as under:—'Head small and flat, and pointed in front. Body long and slender. Skin of throat plicated. A small falcate dorsal fin. Baleen short and coarse. Cervical vertebræ free. Scapula low and broad, with a large acromion and coracoid process,' etc.

These authors then point out that there are four distinct species of this genus in British seas. '*Balænoptera sibbaldii*, the 'Blue Whale,' the largest of all known animals, attains a length of 80 or even sometimes 85 feet. Its colour is dark bluish grey, with small whitish spots on the breast; the baleen is black; the flippers are larger proportionately than in other Rorquals, measuring one-seventh of the total length of the body; and the dorsal fin is small and placed very far back. This Whale has usually 64 vertebræ, of which 16 bear ribs. Like the others of the genus, this species seems to pass the winter in the open seas, and approaches the coast of Norway at the end of April or the beginning of May. At this time its sole food is a small crustacean (*Euphausia inermis*) which swarms in the fjords.'

The latest work dealing with this interesting subject is Lydekker's 'Hand-Book to the Britsh Mammalia' (Lloyd's 'Natural History,' 1896), and it is interesting to find what value is placed upon the Hull skeleton by this author. Speaking of Sibbald's Rorqual, he states, 'Although uncommon, several examples of this magnificent Cetacean have been taken in British waters; the first specimen on record being probably one

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stranded near Abercorn in the year 1692, and described by Sibbald himself, although the specific determination is not absolutely free from doubt. A Whale found floating dead in the North Sea in 1827, which was towed into Ostend, is likewise referred by Sir William Turner to the present species; and another example, of which the skeleton is preserved in the Museum at Edinburgh, was found dead near North Berwick in the autumn of 1831. *More important than all** is a young specimen taken in the river Humber in the year 1847 [should be 1835] the skeleton of which is preserved in the Museum of the Literary and Philosophical Society of Hull, since it was on the evidence of this specimen that Gray gave the name by which the present species is known. Hence the type-specimen of the largest of all living animals is of British origin. . . . A Whale, doubtless belonging to this species, and said to measure 90 feet in length, was found dead off the north coast of Coll, in the Hebrides, in June 1887.'

From the foregoing notes and extracts it will be seen that the skeleton which is now in the possession of the Hull Corporation is one of altogether exceptional interest and value. The changes in the name since it was first described are many. It was first *Physalus* (*Rorqualus*) *sibbaldii* Gray, then *Physalus latirostris* Flower, *Cuvierius latirostris* Gray, *Balænoptera sibbaldii* Bell, Southwell, Flower, and Lydekker, and finally *Balænoptera sibbaldi* (Sibbald's Rorqual), by Lydekker.

* The italics are mine.

NOTE on COLEOPTERA.

***Dorcus parallelopipedus* near Louth, Lincs.**—On Monday, 8th July, at a meeting of the Louth Antiquarian and Naturalists' Society Mr. J. A. Williams exhibited a specimen of the Small Stag-beetle (*Dorcus parallelopipedus*) which he found at North Ormsby on 4th July. It has only been recorded once before for Louth district.—C. S. CARTER, 172, Eastgate, Louth, Lincs., 11th July 1901.

NOTE on BIRDS, MOLLUSKS, and CRUSTACEA.

Lincolnshire Gizzard Records.—On the 30th April 1901, a party of conchologists returning from Towland Lane Woods picked up an adult Starling (*Sternus vulgaris* L.) at the cross roads by Mr. F. M. Burton's house, at Gainsborough. The bird was hardly cold, but the cause of death was not apparent. The gizzard contained a number of the common Pill Wood lice (*Armadillidum vulgare* L.), with fragments of beetle wing cases and parts of other insects too far gone to be identified. *Helix hispida* sufficiently perfect to be named by Mr. J. W. Taylor, F.L.S., who was present; and fragments of variously-coloured and banded *Helix nemoralis*, which looked as if they acted the part of stones for this bird. The true gizzard stones were few, but singularly large and rough for so small a species.—E. ADRIAN WOODRUFFE-PEACOCK, Cadney, Brigg, 2nd May 1901.

Naturalist,

ON THE PAIRING OF LIMAX MAXIMUS.

H. WALLIS KEW, F.Z.S.,

London; formerly of Louth, Lincolnshire.

It has long been known that circumstances of noteworthy character are associated with the copulation of *Limax maximus*. The union itself is remarkable; and, amongst other things, it is found that paired individuals are suspended in the air, heads downwards, by a cord of mucus. The circumstances probably extend to our slug's allies, but otherwise, as far as the writer knows, they are unique. The subject, admittedly, is of some curiosity; and it is undesirable, I think, that our information should remain widely scattered.

The present paper is an attempt to bring together the available information, to which one or two unpublished notes are now added. For help in this, as in other tasks, I am deeply indebted to Mr. G. K. Gude and Mr. R. W. Goulding, who have obligingly prepared for me a number of translations. My thanks are due, also, to Professor Laurent, Mr. Standen, and Mr. B. B. Woodward; and moreover I have to acknowledge, with sad gratitude, the co-operation of the late most kindly malacologists, Mr. Ashford and Mr. Tye.

The phenomena in question, though not often seen, have been observed and described by several naturalists. The first account known to the writer is that of Lister, published in 1678. Passing over a somewhat obscure reference to the subject by Redi (1684), our next author is Werlich (1819), who is followed by Boch-Buschmann and other observers, the last account being that of Mr. L. E. Adams, published in the 'Journal of Conchology' in 1898.

At noontide on a fine day in August, Lister saw two *Limax maximus*—or, as he writes, *Limax cinereus, maximus, striatus & maculatus*—freely hanging in the air, heads downwards, from a knot on the trunk of an old willow. They were sustained by a thick thread, half a yard long, made of their own slime and attached to their tails, which were intertwined; and, while in this position, each animal thrust out, from the right side of the neck, a large copulatory organ. The two organs were soon intertwined, and it was wonderful to see, says Lister, to what an extent they swelled out and with what beautifully striated plumes they were adorned; their colour was pale azure; and

while intertwined they appeared like a pear of medium size hanging from a double petiole.*

Werlich (1819) refers to the pairing of large black slugs, shown by figures to be Limaces, and supposed by Férussac to pertain to a variety of *Limax maximus*. The observations were made towards six o'clock on a damp evening in June, presumably at Rudolstadt. The animals, which were on the trunk of a tree, were approaching one another in circular fashion, the head of one being directed towards the tail of the other; and, as the circle became narrower, the copulatory organs began to appear. After a little time, the tails of the animals united, and their bodies turned downwards, and hanging freely, they coiled round one another spirally. The creatures were probably sustained, at this time, by a slime-cord; but this is not shown in the figures. The copulatory organs, when about an inch long, suddenly approached each other and intertwined, attaining at the same time a length of about three inches (Fig. 1). The intertwining was soon remarkably intimate; the united organs became shorter and more compact, and on some of the whorls, which were at last undistinguishable, a fringe-like border appeared and exhibited extraordinary undulatory movements.†

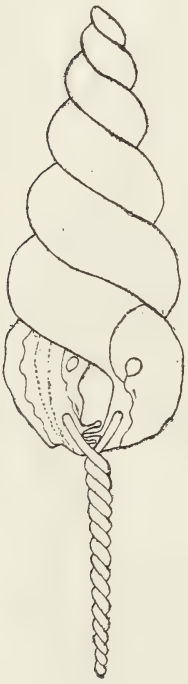

Fig. 1.—After Werlich, Oken's Isis, 1819, Pl. XIII., Fig. 4.

For convenience I have drawn this figure from Férussac's copy, which, though not a facsimile, faithfully represents Werlich's original.

Boch-Buschmann's observation was made—presumably at Luxemburg—upon unidentified slugs, shown by a figure to be *Limax maximus* or a near ally:

A la fin de l'été de 1851, je vis un objet fort étrange suspendu à un arbre placé près d'un mur de mon jardin: c'était un enroulement ornemental digne de figurer dans les arabesques de Raphaël. —A un fil de cristal de 0,15 à 0,20 m. était suspendu un ellipsoïde allongé, tourné en spirale,

* Lister, Historiæ Animalium Angliæ, 1678, p. 129. Lister does not give a locality; he was living at York, however, and the observation is likely to have been made in Yorkshire or Lincolnshire—if in the latter county, possibly at Burwell, where Lister is known to have observed mollusca.

† Werlich, Begattung der schwarzen Schnecken, Oken's Isis, 1819, pp. 1115-7.

de couleur brune.—Au bas pendait, comme un cul-de-lampe, un cône renversé, d'un blanc de lait et translucide comme l'opale.

C'étaient deux limaces qui avaient filé un cordon transparent à l'aide de la mucosité qui transsude de leur corps, pour se suspendre la tête en bas et se tordre comme un double pas-de-vis.

Le cône blanc était formé par les organes reproducteurs également tordus en spirale (Fig. 2).

The slugs, says the author, thus celebrated their wedding between earth and heaven. He did not observe, however, any reciprocal intromission of male organs, the fertilisation being, apparently, external. The intertwined organs exhibited remarkable movements, and even made the whole suspended body oscillate. The author refers also to observations of two of his neighbours: Mr. Mæysz, several years previously, had seen two large slugs suspended from a garden-gate; and Mr. Liez, in December 1852, saw two of these animals (unnamed), one pursuing the other in his garden. At length these latter ascended a wall to a height of 0,60 m., from whence, at the angle of a projecting stone, they descended by a cord 0,20 m. long, entwining their bodies and protruding copulatory organs; after two minutes, however, they fell to the ground.*

Emanuel Purkyne records an observation made in a wood near Prague in June 1857. In this case, as in that of Werlich, the slugs were black, and Purkyne falls into the error of naming them '*Arion empiricorum*.' His drawings, moreover, evidently finished from published figures of *Arion*, show slugs of that genus; but it is clear from the author's figures of the genitalia that the subject of the observation was a large *Limax*. The animals

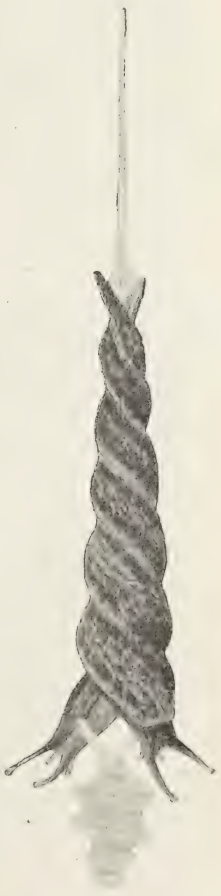

Fig. 2.—After Boch-Buschmann, Mémoires de la Société des Sciences naturelles du Grand-Duché de Luxembourg, I. (1853). Reduced.

* Boch-Buschmann, Observations sur l'accouplement des Limaces, Mémoires de la Société des Sciences naturelles du Grand-Duché de Luxembourg, I. (1853), pp. 91-3; II. (1854), pp. 86-8.

were on the branch of a sycamore, from which their bodies hung down perpendicularly. One gathers, however, that there was no slime-cord, the slugs remaining attached to the branch by the further extremity of the foot. When this position had been assumed, the copulatory organs, which began to appear during some preliminary manœuvres, were suddenly shot out, and the next moment they twisted round one another in spiral form. Thereafter some contraction of the organs took place, the turns of the spiral becoming pressed together, and the organs appearing like flat twisted bands. Finally, while the organs were still twisted together, Purkyne bound them close to the genital openings, and took the animals home for further study.*

Further observations—relating certainly to *Limax maximus*—have been published by Bladon (1858), Baudelot (1863), Daniel (1875-6), Tye (1878), Roebuck (1884: from notes by Mr. Ashford), Laurent (1895), and Adams (1898); and unpublished observations, relating to the same species of slug, have been made by Mr. Standen, Mr. Tye, and the writer.

Bladon's account is based on several observations, presumably made at Pontypool. It has the advantage of being independent of anything previously written, the author believing the facts to be new:

> Towards midnight, in the close, sultry summer nights from June to September, a couple of Limaces may be observed slowly following each other, with the mouth of the second resting on the tip of the tail of the first . . . the second following every sinuosity of the tortuous course taken by the first, without the least deviation, for a considerable time (I watched one pair upwards of a quarter of an hour without any alteration in their relative positions); they then ascend some wall, or other perpendicular surface near where they happen to be; when they finally stop the second crawls alongside the first; they then crawl round each other circularly, during which time they emit a large quantity of mucus, which forms a patch two inches or two-and-a-half inches in diameter: as soon as the mucus has acquired a sufficient consistence, they begin to twist round each other, and detach themselves from the wall, hanging only by a cord formed of the thickened mucus; as they hang suspended, they still keep twisting themselves round each other, forming a double spiral; they continue this turning motion ten minutes or more, until at last their bodies can hardly be distinguished from each other, thus forming a regular cone about two inches in length and the base one or two inches in diameter, hanging from its apex; during this time the mucus cord keeps lengthening slowly (in one instance it reached 15 inches in length; I have not seen any less than 8 or 9 inches); the

* E. Purkyne, Die Begattung des Arion empiricorum, Archiv für Naturgeschichte, XXV. (1859), pp. 26-71.

organs of generation are then protruded from their orifice near the mouth, and, hanging down a short distance, touch each other; they then commence the same spiral motion, twisting round each other, resembling a two-stranded cord. When fully protruded they cannot be distinguished; the lower part then assumes various forms: the first I saw resembled an inverted flat-topped agaric, the portion forming the stem being about two inches in length and two or three lines in diameter, the top being about an inch and a half across: others have formed an ovoid mass suspended in like manner, covered with foliated processes similar to those of a foliated Murex or a leaf of curled parsley; at this time they form a very beautiful object, especially when they hang from some projecting surface, which enables them to swing clear without touching the wall; the dark shell-like substance hanging pendant from a white shining cord, one line in thickness, below which hangs another white semi-transparent body, the delicately striated surface of which shows all over it a continuous vermicular motion; the foliated expansions, continually changing their form or being withdrawn in places and shooting out afresh in others, giving out occasionally an iridescence, as the light falls upon the ever-varying surface. After remaining a considerable time in this position (the vermicular motion continuing without intermission) the generative organs separate, and when nearly withdrawn, the bodies untwist themselves and separate; they then crawl up the suspending line and depart.*

Baudelot twice witnessed the pairing of these animals in his cellar. He remarks that the particulars of their union are extremely curious, and states, as the result of his own observations, that the animals approach one another towards nightfall; that one follows the other, the snout of the second being applied to the tail of the leader; and that the two subsequently stop and creep round one another in a circle. They occupy, with these manœuvres, 2-3 hours; and at last, when the wall on which they are creeping is well daubed with mucus, one detaches itself and becomes suspended by the tail; its companion slides round it, and the two twist together in the form of a screw. The slimy cord, which now sustains the animals, elongates rapidly and attains a length of 1½-2 décimètres; its thickness near the middle is about 3 mm., but towards the upper end it spreads out in the form of a cone, the base of which, about 5 centimètres wide, forms the attachment to the wall. On one side of the neck of each animal, a white tubercle now appears, and rapidly assumes the form of a cylindrical appendage 3-4 centimètres long. Both appendages swing considerably, and on touching, they twist together instantly, their distal parts assuming the form of undulated blades with sinuated margins. The copulation lasts 15-20 minutes, after which the appendages separate, and are withdrawn, rather rapidly, into the body. In one case

* J. Bladon, The Loves of the Slugs, Zoologist, XVI. (1858), pp. 6272-3.

the animals were interrupted by the observer; and in the other, instead of ascending the cord, both fell to the ground.*

Mr. Standen's observation was made, in 1875, at Goosnargh, near Preston. The animals, according to information obligingly communicated to the writer, were about four feet from the ground, and were suspended by a strong cord about two feet long from a branch of a fruit tree nailed against a wall. Their contortions and gyrations were remarkable; twisting round and round, they writhed about in all directions; and, by slowly lengthening the cord, they came within about two feet of the ground. After separation, one ascended the cord and regained the branch; while the other, lengthening the cord, descended to the ground.

Mr. Daniel's observations were made, presumably in the neighbourhood of Heidelberg, during evenings in damp weather. He saw the paired animals suspended, heads downwards, by threads of slime, from the lower branches of fruit trees and from the faces of walls and rocks.†

A pair observed by Mr. Tye were suspended from a wall by a stout thread, 9 inches long, capable (as the observer found) of bearing a weight much greater than that of the two slugs.‡ In another case seen by Mr. Tye (as he informed the writer) the thread was shorter, and was not, as it was in the first case, of a decided yellow colour. In both cases the wall from which the slugs hung was thickly coated with a patch of slime about 6 inches wide.

In the case observed by Mr. Ashford, the animals were hanging from the face of a wall in a garden. A large triangular film of slime formed the base of attachment, and was continued as a rather thick cord, nearly clear of the wall, and firm enough to break with a decided snap when the animals were removed. The total length of this attachment was 5½ inches, and from it the creatures hung by their tails, coiled in the usual manner, while the copulatory organs, hanging below, formed an enormous

* Baudelot, Recherches sur l'appareil générateur des Mollusques gastéropodes, Annales des Sciences Naturelles (4), Zoologie, XIX. (1863), pp. 187-90.

† J. E. Daniel, Thread-spinning by Slugs, Hardwicke's Science-Gossip, 1875, pp. 206-7; Catalogue of the Mollusca found in the neighbourhood of Heidelberg, Quarterly Journal of Conchology, I. (1876), pp. 112-3; and in Jeffreys, British Conchology, I. (1862), pp. 137-8.

‡ G. S. Tye, Molluscan Threads, Quarterly Journal of Conchology, I. (1878), pp. 401-15.

mass, and were in constant motion.* A sketch communicated to the writer by Mr. Ashford shows the tails of the animals very closely and regularly intertwined.

Professor Laurent's observations were made in his garden at Reims, in the month of September, about an hour-and-a-half after dusk. Suspended from a fence by a mucus-cord more than 20 centimètres long, two slugs were rolled corkscrew-wise, one round the other, with the heads downwards. The copulatory organs were united intimately, and they formed a voluminous mass 3 or 4 centimètres long and about 2 centimètres wide. The animals separated soon after the observer had taken up his position. Fortunately, however, at some little distance on the same fence, two other individuals were creeping slowly along, at a few centimètres the one from the other; and, not disturbed by the light which the observer carried, they continued their ascent to a height of about 1m40 from the ground:

Là elles se mirent en contact et après que la seconde eût caressé l'autre de ses tentacules pendant quelques instants, cette dernière se fixa par son extrémité postérieure au moyen d'une abondante mucosité fournie par la glande du pied. En même temps elle se retourna la tête en bas, tandis que sa compagne se plaçait à côté d'elle dans une position semblable.

Les deux animaux ne tardèrent pas à s'enrouler de telle façon que chacun d'eux fit environ un tour et demi autour de son conjoint. On comprend facilement que pendant cet enroulement l'adhérence du pied à la muraille leur fit défaut, aussi je vis le filament muqueux s'allonger sous le poids des deux limaces; il finit par atteindre près de 30 centimètres de longueur.

Les deux pénis faisaient sur le côté droit de chaque animal une saillie d'un centimètre de long sur environ 3m/m de large. Les tentacules étaient bien épanouis, le manteau fortement dilaté, l'orifice pulmonaire largement ouvert; en un mot les deux mollusques présentaient tous les caractères de la plus grande activité.

Il y avait environ cinq minutes que l'enroulement s'était produit quand je vis les pénis s'allonger considérablement et s'enrouler en tire-bouchon exactement comme venaient de le faire les corps des deux limaces. D'abord cylindriques, ces organes ne tardèrent pas à s'aplatir tout en continuant à se tordre; on les voyait glisser l'un contre l'autre à la façon d'un large écrou que l'on promène dans une vis à long pas. L'excitation produite par ce glissement provoqua bientôt une érection plus considérable de l'organe qui prit l'aspect d'une lame aplatie atteignant un centimètre de largeur et dont le bout paraissait nettement frangé.

Les extrémités des pénis se mirent bientôt en contact, tandis que les spires supérieures de plus en plus serrées formaient une sorte de dôme de 2 centimètres de largeur rappelant l'ombrelle d'une Méduse sous laquelle la partie terminale des pénis formait un battant volumineux.

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* W. D. Roebuck, Limax maximus v. maculata Picard in Britain, Journal of Conchology, IV. (1884), p. 150.

L'accouplement dura environ 13 minutes après la réunion des pénis, alors qu'un liquide blanchâtre, probablement le sperme, suintait sur les bords de l'ombrelle. Puis les deux individus se séparèrent; celui qui s'était fixé par un cordon muqueux resta en place, tandis que l'autre s'éloignait le premier. Fig. 3 is a copy of a drawing which illustrates this account.*

Mr. Adams, in July and August 1897, observed a number of cases all of which occurred at night, between 10 p.m. and 2.30 a.m. In one case, the animals were suspended from a projecting beam in an outhouse; in another, from the leaves of a currant bush; in another, from the branch of a yew tree; and in another, from a glass pane of a greenhouse. A perpendicular wall or tree-trunk, however, was the usual situation:

Fig. 3.—After Laurent, Bulletin de la Société d'Étude des Sciences naturelles de Reims, IV. (1895), p. 25. Reduced.

When the pursuer overtakes the pursued, each touches with its tentacles the tentacles of the other, after the manner of ants. Then begins a circular procession, each with its mouth at the other's tail, and this procession lasts from half an hour to two hours and a half. Careful observation leads me to suppose that during this performance each is eating the external mucus from the other, for a purpose which will presently appear. The circle now grows more contracted, the slugs overlapping and showing evident excitement, the mantles flapping before and behind. Then, suddenly, the slugs intertwine fiercely, and launch themselves into space, head downwards, but suspended by a thick strand of mucus, for the distance of 15-18 inches. This mucus thread, which they seem to have been collecting for the purpose, is of a yellowish-brown colour, and does not seem to mingle with the mucus on their bodies. The fall is generally as rapid as if there were no support, but is gently checked at the finish. On one occasion, however, the fall was very gradual, and during the descent the couple were busily eating more mucus from each other's bodies. The thread appears to come from their mouths, and runs along the centre of the foot-sole of each, joining into a single thread where their tails intertwine. The upper part of the thread is joined to the circular patch of mucus left on the wall where their previous gyrations have taken place.

* J. Laurent, Observations sur l'Epeire et sur le Limax cinereus [= *Limax maximus*], Bulletin de la Société d'Étude des Sciences naturelles de Reims, IV. (1895), pp. 23-35.

As soon as the descent is accomplished, Adams adds, an organ is protruded from the genital orifice of each animal. This organ, cylindrical at first, quickly assumes a club shape of from 1½-1¾ inches in length. Presently a frilled edge appears along one side as if unrolled, and in a second or two the unrolling is complete, the organs assuming a broad flattened blade-like shape with a thin wavy edge. The organs now intertwine, finally closing round each other so as to form a knot, of which it is easy to count the whorls. The two upper whorls now spread out, and generally overlap in the form of a mushroom or umbrella, leaving the lower part of the knot as before. (Fig. 4.) Sometimes, however, the two outspread whorls, instead of overlapping, curve in different directions; and sometimes they maintain a nearly horizontal position. In colour the organs are milk-white, flecked here and there with dead white. During 5-10 minutes the slugs hang with the body motionless and the tentacles contracted and flabby, while the two outspread whorls keep revolving upon one another; and in this extraordinary manner the copulation is effected. This ended, the process above described is reversed. The organs unwind, roll up, and finally disappear. It now usually happens that one of the animals drops to the ground, while the other climbs the cord to the point of support. On one occasion, however, neither slug dropped, but one ascended the thread while the other remained stationary; and then the other followed, leaving the thread dangling.*

Fig. 4.—After Adams, Journal of Conchology, IX. (1898), Pl. III., Fig. 9. Reduced.

The present writer has observed one case only, and that in a garden in Hornsey in September 1899. About 10 p.m. the two animals, which differed somewhat in size, were seen on the ground, the one following the other, the mouth of the second resting upon the tip of the tail of the first. At this time the larger slug was leading; but afterwards, when the animals ascended a post, the smaller led the way. At 10.45, when

* L. E. Adams, Observations on the pairing of Limax maximus, Journal of Conchology, IX. (1898), pp. 92-5.

observation was resumed, the animals were suspended by a thick irregular cord 9 inches long. Their bodies were intertwined, not very closely and regularly, but more so than in Figs. 3 and 4. The copulatory organs—hanging below the heads of the animals—were exhibiting great activity and were intertwining; and, as they became more closely associated, they displayed the remarkable wavy processes and curious continued movements described by authors. The tail of the larger slug now became detached from the cord, and the two slipped down, the cord lengthening to 12 inches or more, and allowing the united organs to touch the ground. Soon afterwards (about 11 p.m.) the organs separated, and were rather quickly withdrawn.

According to Adams, the cord is sometimes eaten by the slugs; often, however, as he states, it is left untouched, and may be seen for days on walls, tree-trunks, etc. Dried cords in such situations, always associated with circular patches of iridescent mucus, have several times been noticed by the writer. In July 1893, to give one instance, the trunk of an oak was observed to be conspicuously smeared with trails and patches of slime, and running from the largest of the patches was a thick cord, about 4 inches long, partly adherent and partly free. On visiting the spot with a lantern at night I found the tree to be inhabited by *Limax maximus*. The cords are composed of a stiff, clouded, more or less yellow mucus, which dries rapidly and becomes brittle; they are, moreover, of considerable thickness; and thus they differ greatly from the ordinary mucus-threads by which single slugs descend through the air, the latter threads being extremely fine, and silky when dry. As in the case of ordinary threads, however, the mucus proceeds along the foot-sole, the cord leaving the bodies at the tail; and it has been suggested to me, both by Mr. Ashford and Mr. Standen, that the difference merely results from the greater discharge of mucus at the time of copulation. I am doubtful, however, on this point; and it may be remarked that the function of the cord is to hold the animals suspended, while the ordinary thread is produced during progression. It will probably be found that Adams is mistaken in supposing the mucus of the cord to come from (i.e., out of) the mouths of the slugs, the idea that its formation is dependent upon the eating of slime during courtship being almost certainly erroneous.

The suspension of the paired animals heads downwards by the cord of mucus is certainly a remarkable circumstance; no

less remarkable, further, are the other circumstances attending the union: the intertwining of the animals' bodies, often with great regularity and closeness; the great development and extreme mobility of the non-erectile organs of copulation; their suspension below the heads of the animals; their rapid and intimate intertwining; their extraordinary sinuated expansions, etc. All these things, however, are probably eclipsed by the character of the copulation itself. It is necessary, if one is to attempt to understand the process, to remember that each individual of animals of this kind possesses both male and female organs; that there is but one genital pore; and that this pore, in *Limax maximus*, has little or no vestibule, the penis, the oviduct, and the duct of the receptaculum seminis opening to the exterior practically at the same spot. Further, one may advantageously refer to a figure of the genitalia of this particular slug—as seen when dissected from the body of the animal—such as that given by Baudelot, or that of Scharff, Scientific Transactions of the Royal Dublin Society, IV. (1891), Pl. LVII.

One finds it impossible, at first, to reconcile the organs as thus figured, with the appearances presented during pairing. The penis, compared with that of other slugs, is certainly long; but it seems quite inadequate. There is no doubt, however, that the organs presented to view are the penes, everted, and in a state of great distension. This is clearly shown by Baudelot (who severed the organs in one of the copulations observed by him), and also by Mr. W. M. Webb, who examined a coupled pair of organs severed by Mr. Adams. In the latter case, one of the penes was but half everted; it bore interiorly the retractor muscle, cut off short, and a part of the vas deferens. The other was completely everted, and showed the peculiar 'frill' on one side; the vas deferens could be traced down the interior of the tube, but the retractor muscle was not discovered.* The matter had previously been made clear by Purkyne, who gives a drawing, of which Fig. 5 is a copy. We have already seen that this naturalist bound the extruded organs of his paired slugs close to the genital opening, his purpose being to compare the anatomy of the animals thus treated with that of others not taken in copulation. He found the extruded organs to be the penes in a state of complete eversion. *Kl* in the figure is the genital opening, the organ below being the everted penis; the vas deferens (*vd*) and the retractor muscle (*m*) run down

* W. M. Webb, in Adams, l.c.

within the penis, the opening of the vas deferens (*f*) becoming external.

It will be remembered that Boch-Buschmann long ago suggested that the sexual union does not here involve intromission of the penis. This suggestion, at first sight, seems improbable, and Professor Jourdain, who has discussed the point, believes that copulation with intromission will be found to take place in *Limax maximus* as in other slugs.* When we glance at Fig. 5, however, and observe the small size and position of the receptaculum seminis and its duct (*rs*), and the relatively vast dimensions of the everted penis, we cannot readily dismiss the suggestion of Boch-Buschmann, and I think it may be said to be established that no intromission occurs. This view is expressly supported by Purkyne, Baudelot, Laurent, and Webb. One has to note further that no observer appears to have seen anything tending to weaken it, no approach being made by the penis of either animal towards the genital aperture of its fellow.

How then does the sperm—discharged from the opening of the vas deferens at the extremity of the penis—find its way into the duct of the receptaculum seminis? Purkyne, who says that he could see the chalky white sperm through the transparent walls of the intertwined penes, supposed it to be discharged into the interior of the spiral, and to be forced upwards to the genital apertures by the contractions and movements of the organs. The observer finds support for this idea in the fact that in the penes which he bound during union, sperm was found in clumps on those parts of the surface of the organs which, when they were intertwined, had formed the inner wall of the spiral (Fig. 5, *sp*). Baudelot, on the other hand, arrived at a somewhat different conclusion. He found within the cavity of the penis a considerable longitudinal fold. This, of course, becomes external when the organ is everted, and it is supposed to give rise to the 'frill' already referred to. It serves also for the formation of a longitudinal groove upon the everted organ; and this groove, Baudelot thinks, is of considerable functional importance. While the penes are wound together, he says, the sperm, running from their extremities, probably spreads over the corresponding organ of the other animal, and is received by the groove; and, according to this view, it is when the organs

* Jourdain, Note sur les organes génitaux et l'accouplement de quelques Limaciens, Revue des Sciences Naturelles, VII. (1878), pp. 421-2.

are withdrawn that the sperm runs from the groove into the duct of the receptaculum seminis. The author states, as the ground for this belief, that though the penes examined by him were not severed from the body till the moment the union ceased, the groove was yet full of sperm. In both animals, the receptaculum seminis, which would have received the sperm from the groove had the penis been withdrawn, was empty. Baudelot is supported by Webb, who writes: 'One would say that the use of the penis is to convey the sperm cells to and not into the female orifice, its frill being developed for the purpose of holding them during the act of passing them over to another individual.' According to Laurent, however, this view is unsatisfactory, and the matter is one to which our northern observers —to whose interests 'The Naturalist' is devoted—might usefully give attention.

It is difficult to form an opinion as to the circumstances under which the remarkable manner of pairing now described has arisen. The animals' suspension, heads downwards, seems necessary in order that the penes may depend freely and be safe from contact with foreign bodies; and this can only be accomplished from perpendicular or projecting objects, the faces of walls and rocks, the trunks and branches of trees, etc. It is in places of this kind that *Limax maximus* usually makes its home; and couples which meet on the ground are observed to ascend to such places before pairing. Possibly the phenomena indicate a former more complete restriction to trees, or to precipitous rocks, such, for instance, as those on which Andrews discovered *Geomalacus*.

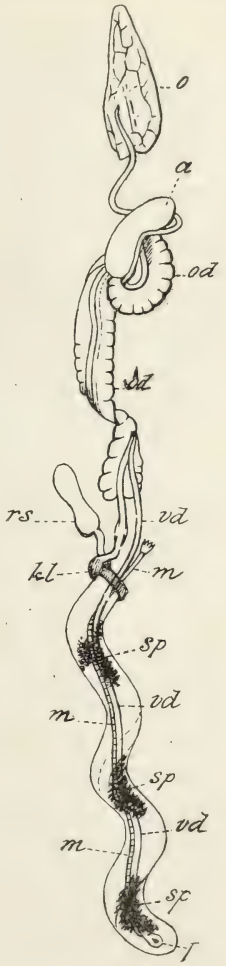

Fig. 5.—Genitalia of a large slug of the *Limax maximus* group. After Purkyne, Archiv für Naturgeschichte, XXV. (1859), Pl. VIII., Fig. 6; presumably diagrammatic in part. *Kl*, genital aperture, the organs above being permanently internal, and that below—the everted penis—external during pairing; *vd* and *m*, vas deferens and retractor muscle, seen through the walls of the penis; *f*, opening of vas deferens; *sp*, sperm on outside of penis; *o*, hermaphrodite gland; *a*, albumen gland; *od*, oviduct; *rs*, receptaculum seminis.

One can hardly believe that suspension in pairs, and the remarkable circumstances associated with it, are absolutely peculiar to *Limax maximus*. It is certain that nothing of the kind occurs in our Limacids of other genera, *Amalia*, *Agriolimax*, etc.; but in *Limax* proper, particularly in those forms belonging to the group of *Limax maximus*, one may reasonably expect phenomena distinctly comparable with those now described. There is a probability that Werlich's and Purkyne's slugs were *Limax cinereo-niger*, a form belonging to the group just mentioned, and often said to be a mere variety of *Limax maximus*; but according to Daniel this slug 'prefers terra firma to mid-air,' from which one understands that it has been observed to pair on the ground.

Daniel is said to have seen the tree-slug (*Limax arborum*) 'in couples during the pairing-season suspended by slimy threads from the branches of a tree'; but, in the absence of confirmation, one cannot feel sure that this is not a mistake, for *Limax arborum* is subgenerically distinct from *Limax maximus*; and its genitalia differ, the penis being short, and furnished with a flagellum.

NOTES on LANCASHIRE FLOWERING PLANTS.

South Lancashire Rubi.—On the 6th of July I found *Rubus pulcherrimus* Neum. growing in hedges between Lydiate and Altcar. It has not previously been noted for Vice-County 59, which is rather surprising, seeing that it is so plentiful in parts of Vice-Counties 58 and 60. Other Rubi seen in the same vicinity were *R. Lindleianus* Lees, *R. gratus* Focke, *R. calvatus* Blox., *R. selmeri* Lindeb., *R. leucostachys* Schleich., *R. rosaceus* W.&N. (aggregate), *R. corylifolius* Sm., and *R. dumetorum* var. *ferox* Weihe. —J. A. Wheldon, Liverpool, 15th July 1901.

Casual Plants at Aintree, near Liverpool.—The canal banks at Aintree are famous for the production of interesting plants. Some of these disappear after a single season, others reappear from year to year. I have recorded a number of these in the various Reports of the Botanical Exchange Club. On the 13th July a stroll along the canal bank enabled me to note the following amongst other less interesting species :—

Camelina sativa Crantz.
Lepidium sativum L.
Thlaspi arvense L.
Saponaria Vaccaria L.
Melilotus officinalis Lam.
Melilotus indica All.
Epilobium angustifolium L.
Malva borealis Wallm.
Bupleurum rotundifolium L.
Carum Carui L.
Conium maculatum L.
Xanthium spinosum L.
Carduus setosus B.
Marrubium vulgare L.
Amaranthus retroflexus L.
Chenopodium opulifolium Schrd.
Chenopodium ficifolium Sm.
Abundant, extending over neighbouring fields in profusion.
Chenopodium urbicum L.
Chenopodium rubrum L.
Setaria viridis Beauv.
Phalaris paradoxa L.
Phalaris minor.
Apera spica-venti Beauv.
Avena fatua L.
Poa palustris L.
Bromus arvensis L.
Bromus unioloides Kunth.

—J. A. Wheldon, Liverpool, 15th July 1901.

Naturalist,

NOTE on DRAGONFLIES.

***Libellula quadrimaculata* at Elland.**—On 21st April I had brought to me a Dragonfly (*Libellula quadrimaculata*), and between that date and 4th May no less than seven different individuals came under my notice, many of them having been caught in the streets. Mr. G. T. Porritt has confirmed the specific identification for me. As this species had never been noticed before in this district and none have been seen since, it would be interesting to know the probable cause of this extraordinary appearance.—J. E. Crowther, Elland, 8th July 1901.

NOTES on LEPIDOPTERA.

Small Elephant Hawkmoth near Sleaford, South Lincs.—In June last I received a beautiful specimen of the Small Elephant Hawkmoth (*Chærocampa porcellus*). It was taken in a house in Rauceby (near Sleaford), Div. 14 West.—S. C. Stow, Court Leys, Brandon, Grantham, 22nd July 1901.

***Colias hyale* near Grimsby.**—I am pleased to report the occurrence of *Colias hyale* in this district.—A. Smith, 5, Cavendish Street, Grimsby, 12th July 1901.

[Could not details, time and place, be stated?—Eds. Nat.]

***Sphinx convolvuli* near Doncaster.**—On Tuesday, 16th July, I found in our garden at Armthorpe a somewhat damaged specimen of *Sphinx convolvuli*. It was on a wooden bridge under the shade of a Virginian Creeper.—Agnes Eden, White House, Armthorpe, Doncaster, 28th July 1901.

***Acherontia atropos* at Blaxton, near Doncaster.**—To-day I had brought to me a living, fresh specimen of *Acherontia atropos*, which had been caught on a bee-hive at Blaxton, near Doncaster, on the 7th inst. Whether the insect be an immigrant or a native (the produce of last autumn's larva) will be a moot point. But the place of capture, a 'bee-hive,' is interesting in connection with the disputed question of *A. atropos* being a honey robber.—H. H. Corbett, Doncaster, 8th June 1901.

***Arctia lubricepeda* var. *radiata* at Doncaster.**—Yesterday, while walking in the heart of the town here, I noticed a boy playing with an insect on the pavement. Looking to see what he had, I found a male var. *radiata* in fairly good condition. This var. having been bred by artificial selection by collectors in many parts of Yorkshire during recent years, suggests the probability of my specimen being 'an escape from cultivation.' Against this supposition I do not know of any *radiata* having been bred in Doncaster.—H. H. Corbett, Doncaster, 10th June 1901.

Life-History of Little Blue Butterfly near Wetherby.—The best insect regularly occurring in the district is the Little Blue Butterfly (*Chrysophanus minimus*), always common on the rough banks of road and rail about Wetherby and Collingham. It flies in late May, but the pinky larvæ will now be found *in the flower-heads* of the Lady's Finger Vetch, where they persist unchanging till the pupation-time of Spring's first sunny days. *Anthyllis* is common, and a few hundred heads can be carried home for examination at leisure.—F. Arnold Lees, Meanwood Lodge, Leeds, 15th July 1901.

Lepidoptera Observed in the Huddersfield District.—On the 27th May I was searching for Lepidoptera at Dunford Bridge and boxed imagos of *Hadena glauca* and some splendid dark forms of *Fidonia atomaria*. Larvæ of *Hypsipetes elutata* were abundant on the bilberry, and I also found a batch of ova of *Orgyia antiqua* from which a quantity of larvæ have since hatched out.

On the 28th May I visited Cawthorne. Most noticeable were hybernated specimens of *Vanessa urticæ* and the larvæ of the same species was also common on the nettles.—W. E. L. Wattam, Newsome, Huddersfield, 11th June 1901.

NOTES on BIRDS.

Squirrel and Spotted Woodpecker.—Mrs. E. G. Cracroft-Amcotts writes from her place, Kettlethorpe Hall, Lincoln:—'We feed Squirrels (*Sciurus vulgaris*) liberally close up to the house, and even on the window sills. In the winter of 1899-1900, a Spotted Woodpecker (*Dendrocopus major*) came daily to dispute with the Squirrels over the nuts, within two yards of the window. We have several Spotted Woodpeckers in the woods, especially in the 'Quebec.'—E. Adrian Woodruffe-Peacock, Cadney, Brigg, 13th May 1901.

Curious Nesting-Site of Blue Tit near Flamborough.—We frequently hear of curious nesting-places chosen by birds. This year, on the 20th of June, I found a pair of Blue Tits (*Parus cæruleus*) had chosen a very strange position. A few miles from Flamborough, indeed close to Bempton, a pair of whale's jaws have been erected over a gateway. One of these jaws is very much decayed, and a hole runs right down the centre. This hole had been selected by the Tits as a home for their children, and a fine brood of six or seven were just ready to fly.—K. McLean, Harrogate, 21st June 1901.

Bird-Notes from Court Leys, Lincs.—Owing perhaps to the hedges being so bare of leaves at the nesting-time, many birds come to make their homes in the evergreens in the garden here; and the garden is not particularly suited for nesting, being very open, having only a single row of bushes round it, and passed on one side by the high road, and it is on this side, too, that most of the nests occurred.

The following are a few of the nests we noticed:—Two pairs of Robins (*Erithacus rubecula*) brought off five young ones each, in the ivy; they sat for twelve days; the young ones hatched on 7th May before 9 a.m.; both lots left the nest on the evening of 20th May; one nest contained a sixth egg.

A Thrush (*Turdus musicus*)'s nest, containing five eggs, was forsaken, and another pair fell a prey to 'Tabby' when the four young ones were six days old. Probably for the same reason a Missel Thrush (*Turdus viscivorus*) left her nest in a yew bush, after sitting for seven days on three eggs.

Two pairs of Blackbirds (*Turdus merula*) each safely reared four young ones.

One pair of Hedge Sparrows (*Accentor modularis*) reared five, and another four young ones; the fifth egg in this last case was addled.

A brood of Green Linnets (*Ligurinus chloris*) were brought up in the same yew bush as the nest of Thrushes were.

Five Chaffinches (*Fringilla cælebs*) managed to thrive in their tiny nest; the eggs were laid each day before nine in the morning; the old bird sat for eleven days, the young ones hatched on 14th May, and left the nest on 28th May.

In a hole in a branch of a wych elm, which forms an arbour, an Ox-eye Tit (*Parus major*) brought up nine young ones; they hatched on 31st May, and flew away on 15th June. We found her when sitting, and much wanted to see the eggs, but, though allowing us to stroke her, she would not leave the nest.

There are two Wren (*Troglodytes troglodytes*)'s nests in the hawthorn hedge, but no eggs in either yet.

A pair of Swallows (*Hirundo rustica*) particularly wished to build in the summer-house, but, because of the litter they made, we had to close up the door and windows, but when, every few days, the shutters were taken down they came instantly back, and commenced to build, and it was not until more than a fortnight had elapsed that they were banished.

A Cuckoo (*Cuculus canorus*) often comes and sits on the tennis poles; we first heard it on 21st April.

I have noticed that there are many more birds' nests in hedges here this season than there have been for some years, also that they contain more eggs; in 1897 many of the Blackbird and Thrush nests contained but three eggs.—S. C. Stow, Court Leys, Brandon, Grantham, 25th June 1901.

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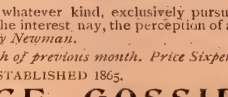

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NATURALISTS IN SOUTH LINCOLNSHIRE.

Rev. EDWARD ADRIAN WOODRUFFE-PEACOCK, L.Th., F.L.S., F.G.S.,
Vicar of Cadney; Organising and Botanical Secretary, Lincolnshire Naturalists' Union.

The twenty-ninth field meeting of the Lincolnshire Union was held in the episcopal city on Saturday, 29th September 1900. The unusual cataclysm of the general election kept many well-known members away; and the day proved anything but a fruitful one, though it was as lovely as could be desired.

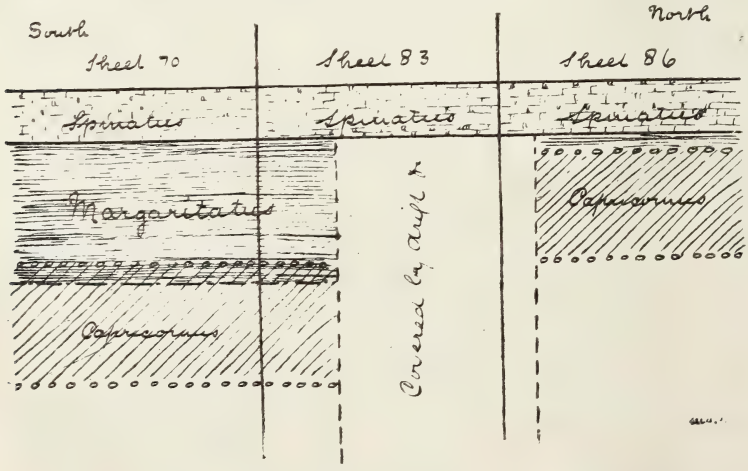
Leaving Lincoln the party arrived at Harmston Station at 10.21, and followed the footpath by the railway to the south of the station. Leaving the line they passed through Coleby village, visiting a disused brickyard and small quarry. Passing to the east of Boothby Graffoe they followed the line of the cliff road to Navenby. After inspecting another quarry and brick-yard, Lincoln was reached by train from Navenby Station, and a jolly if small party assembled for tea at the Saracen's Head.

Mr. H. Preston, F.G.S., reports:—To the geologist the day proved very instructive, as we were able to examine several interesting sections ranging from the Middle Lias upwards to the Lincolnshire Limestone (Inferior Oolite). At Coleby a section 5 feet thick occurs in the village street, which shows a massive, sandy, ferruginous limestone belonging to the Northampton Sands series. This rock underlies limestone of the Inferior Oolite series, and the junction of the two beds is well seen where the section forms the base of a stone wall. A limestone quarry in the same village was visited, and some good *Pholadomya* and *Modiola* were found, chiefly in the marly partings between the limestone bands; whilst a fragment of a crustacean (*Eryma ?*) was obtained from the solid limestone bed.

At Boothby Graffoe a similar quarry in the Lincolnshire Limestone yielded *Pinna cuneata* amongst other things; and it was interesting to notice in this quarry the changes which are coming on in the character of the limestone beds. These changes are noticeable in the numerous clay and marly partings which occur between the more massive beds of limestone, and in the bands of pale grey, whitish, impure, nodular limestone which are seen here and at Coleby. These limestones are much more massive in the southern part of the county, and the changes which were seen in this quarry increase as we travel northwards until the Lincolnshire Limestone is divisible into an upper and lower group just before entering Yorkshire, known as the Hibaldstow and the Kirton beds.

At Navenby the passage downward from the Oolites through the Northampton sands to Upper Lias clay was seen in an interesting section close by the churchyard wall, where a ditch had recently been re-cut. The so-called Fish and Insect beds at the base of the Upper Lias were examined in a clay-pit at the foot of the escarpment, and good specimens were obtained crowded with the characteristic fragments of *Inoceramus*. These fragments have the appearance of scales of fish and wings of insects, and have given the specific name to this basement bed of the Upper Lias.

Occasion was taken when searching for the Middle Lias beds to refer to the absence of the marlstone for a distance of 12 miles along the cliff escarpment, between North Carlton on the north and Wellbourn on the south; and to the palæontological zones which immediately underlie the Marlstone Rock bed. Reference was also made to the interesting changes which take place in these zones, and in fact in the whole Jurassic series of Lincolnshire between the south and north of the county. These differences in the strata and range of fossil forms often make it very difficult to assign boundaries to the formations. As a typical example the following diagrammatic sketch was given in illustrating the boundary between the Middle and Lower Lias.



The southern, middle, and northern parts of the county are covered by geological survey sheets Nos. 70, 83, and 86 respectively. In sheet 70 the two Zonal Ammonites, *spinatus* and *margaritatus*, are embraced in the Middle Lias, the Capricornus

Zone which occurs below, and which slightly overlaps the Margaritatus Ammonite, being placed as Lower Lias. In the north of the county *Ammonites margaritatus* has not been found, and there occurs but a few feet of clay between the Rock bed (zone of *Am. spinatus*) and *Am. capricornus*; so that either the Middle Lias is represented only by the Spinatus Zone (Rock bed) and some five or six feet of clay beneath, or the *Am. capricornus* must not be taken as a Zonal Ammonite in the north of the county, and the 60 or 80 feet of clay just underlying the Rock bed must be classed as Middle Lias, notwithstanding that it contains *Am. capricornus*. This is the view usually adopted. Unfortunately a large portion of sheet 83 is obscured by drift deposits, and the actual dying out of the Margaritatus Clays and the coming in of the Capricornus Clays cannot be traced, or a very pretty chapter in Lincolnshire geology would be elucidated.

Miss S. C. Stow and Mr. J. S. Sneath reported on the following plants. Under two hundred species were observed, but the dry weather accounted for the poverty of the flora. The following is a selection:—*Erysimum cheiranthoides,* near Harmston Station; *Coronopus Ruellii,* Navenby; *Raphanus Raphanistrum,* Harmston; *Saxifraga tridactylites,* Coleby village; *Filago minima,* by railway, Harmston; *Hieracium boreale* and *H. umbellatum,* the same. At Coleby, *Specularia hybrida* and *Calamintha arvensis* in a quarry. Miss Stow pointed out to us the upper leaf aborted by the grub of *Cecidomyia veronicæ*. *Lycium* was growing as an escape in Navenby, with the native *Salvia verbenaca*. *Lamium amplexicaule* was seen in more than one spot; and *Aira caryophyllea* by the railway at Harmston.

Miss S. C. Stow reports the following mosses, a good list for such a time:—

Ceratodon purpureus Brid.
Fissidens taxifolius Hedw.
Dicranella varia Schp.
Barbula unguiculata Hedw.
Orthotrichum diaphanum Schrad.

The following six species were found on a wall in Coleby village:

Grimmia pulvinata Sm.
Tortula pusilla Mitt.
Tortula lamellata Ldb.
Tortula ambigua Angstr.
Tortula muralis Hedw.
Barbula fallax Hedw.
Mnium undulatum L.
Thuidium tamariscinum B.&S.
Pleuropus sericeus Dixon.
Camptothecium lutescens B.&S.
Brachythecium rutabulum B.&S.
Brachythecium purum Dixon.
Eurhynchium Swartzii Hobk.
Eurhynchium striatum B.&S.
Amblystegium serpens B.&S.
Hypnum cuspidatum L.
Hylocomium squarrosum B.&S.
Hylocomium triquetrum B.&S.

The conchologist had a holiday. Nothing was seen but the commonest *Zonitidæ* and *Helicidæ*.

The sweeping-net proved useless for collecting insects. I could get nothing worth sending to Mr. Thornley. Mr. J. Eardley Mason's report represents a day's want of work. It runs as follows :—The only insects noted by me were—Coleby, one *Vanessa iö* (Peacock Butterfly), the Larger and Smaller White Butterflies, and the Bug *Tetraphleps vittata* Fieb., one specimen off spruce fir at Boothby Graffoe.

NOTE on METEOROLOGY.

Occurrence of Snow every Month in England.—An Englishman, when asked why he lived abroad the greater part of his time, replied, 'I can do with your winters very well but I can't stand the rigours of an English summer.' Well, we certainly have a somewhat rough and fitful climate; enough to justify the American's description of it as 'no climate at all, only a number of samples'; but it may surprise some people to hear that snow falls, occasionally, in our favoured land, in every single month of the year. Let us not quarrel with our climate, however, but '*live* up to it' and be thankful, for it is one of the causes of England's aptitude.

No need is there to speak of the colder period, from October to May, when snowstorms are prevalent, and it is scarcely necessary to allude to June, as snow is at least an occasional visitor during that month; but when we come to the other three—July, August, and September—snow in these months is of rare occurrence. The 'dog days' are not usually associated with snow, nor are the mellowing days of September; but, though occurring seldom and at rare intervals, records of snow in each of these months exist.

Looking through my diary from the beginning of the year 1852 to the present time, I find one record, and one only, for each of the two months July and August, and several for September.

In 1888 the month of June had been extremely cold and wet, very little hay had been cut, and the coming in of July did not break the spell; for the same bad weather lasted through the whole of that month, and on the 11th snowstorms occurred, as the newspapers of the day recorded, 'in the Lake District, in Notts., Derbyshire, and near London at Norwood.' Most of the hay was spoiled, and by the 31st of July a great deal had not been cut.

Passing on to August—just ten years later—in 1898, on the 8th of that month, I have the following record, taken again from the newspapers: 'To-day snow falling in the Anglesey district, covering the land for miles.'

In September I have several accounts of snow in my 'diary.' The earliest in 1856, at Uppingham in Rutlandshire, where I was then living, and where, on the 22nd of the month, I recorded: 'Snow and heavy rain.' The next entry is in 1893, at Gainsborough, when, on the 29th of the same month, after several very cold days, with the thermometer down to within three degrees of freezing, 'a thunderstorm, with rain and snow, passed over the town, bringing the long spell of summer, which had lasted nearly seven months, to an end.' In September 1899, the following entries occur, all relating to Gainsborough: On the 22nd, 'Very heavy wind with snow'; on the 27th, 'Snowing a little'; and again on the 30th, 'Snow and heavy rains with thunder in many parts.'

I do not of course suppose that the above are the only occasions of snow falling during the months of July, August, and September; there are doubtless others, but when we reflect how local and transient the fall would be during the summer season, and how few would observe it at all, and of these few, how few again would take the least interest in it; we cannot wonder at the poverty of the record. Still, the above extracts are sufficient to prove that in England no month of the year is absolutely free from snow. —F. M. Burton, Highfield, Gainsborough, Lincolnshire.

In Memoriam.

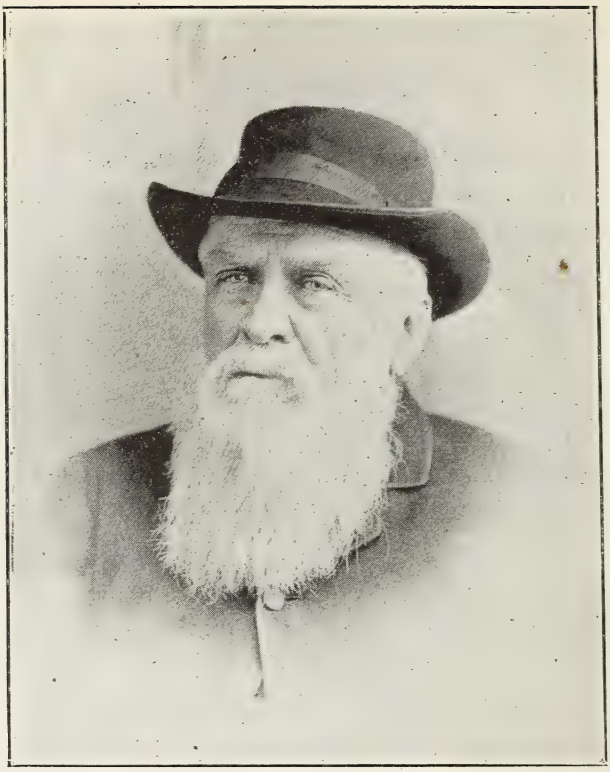
WILLIAM HODGSON, A.L.S.,

THE VETERAN BOTANIST OF CUMBERLAND.

William Hodgson was born at Raughton Head on the 7th April 1824; he died at Workington on the 27th March 1901.

At the early age of 17 he was appointed Head Master of the parish school at Watermillock, and in 1851 he became master of the parish school at Aspatria. He continued there until 1875, when he went to the school at Frizington, but in the course of two or three years he returned to the Watermillock School, where he remained until his retirement in 1884. The remaining 17 years of his life were spent in the quiet enjoyment of nature by the sea-shore and amid the hills and valleys which he loved so well.

It would be difficult to find a place more fitted to nurse into life a love of nature than the district in which William Hodgson was born and in which he spent his youthful days, and one can well imagine how he first learned, amid the rural attractions of Raughton Head and the adjacent village of Gatesgill, to take an interest in the wild flowers and in all the living things around him, an interest which remained with him and provided a source of constant delight and happiness throughout his life of nearly 77 years. He loved nature in her entirety, rocks, insects, birds, animals, and all, but botany was that which lay nearest to his heart. He was unable to point to any particular circumstances which influenced him in making botany his special study, but, perhaps, the first occasion on which he became practically acquainted with the difference between one species and another is referred to in the following story, given in his own words :— 'I remember, when a schoolboy, being elected to fill the post of huntsman in a game of 'hare and hounds.' Of course I must have a hunting horn. A robust stem of *Heracleum sphondylium* (Hogweed) grew quite handy, and was quickly utilised for the purpose, which it served admirably. The consequences were decidedly unpleasant. For ten days or more my lips were in a painfully chapped and excoriated state. On explaining the cause to an aged neighbour his remark was, 'Served you right; you will use the Smooth Kesh next time you want a hunting horn!' I believe the man was right. The Smooth Kesh, or Wild Angelica, has certainly less irritating juice than the plant I had used.'



202 Harrington Road.
Workington. July 1st
1899.

Dear Sir. I return such of your plants as you have named as I believe correctly.

Faithfully yours

Wm Hodgson.

Naturalist,

Again and again, as opportunity offered, he returned in after life to his favourite haunts. 'Gatesgill is a beauty spot indeed,' he would say, 'especially when *Prunus avium* is in bloom,' and nothing pleased him better in his latter days, when age and infirmity prevented him from roaming over the country, than to wander along the banks of the river Roe and fish in its waters, for he was a keen angler, or to pay a visit to the spot where he knew some rare specimen was to be found. Although it might almost be said that he knew every square foot of certain districts in Cumberland, yet when writing last year about 'another sally up the Ellen Valley,' where he had gone 'ostensibly to fish,' he stated that he had come across a strange willow, and 'you may take it as a revelation to me to find a practically unknown willow by a stream which I had known and fished for fifty years save one.'

His guiding principle, as he admitted, was 'Freely ye have received, freely give,' because he remembered, with the greatest thankfulness, the kindness and help which had been given to him by his early mentors in botany. Whenever he found a rare plant he hastened to send on a specimen to some kindred spirit, believing that others would like to enjoy the discovery as heartily as he did himself; and not only that, but he took almost as much delight in the discoveries of others as if they were his own. There was nothing selfish in him, for his stores of information, especially on the Cumberland Flora, were open to anyone who came forward, and he always gave botanical help with a liberal hand for the pure love of it. In fact, this kindness of heart will ever be associated with the name of William Hodgson by everyone who had the privilege of coming in contact with him or receiving assistance from him. The Rev. H. A. Macpherson wrote truly when he said of him, 'We never gripped his hand without feeling the better for it. Wherever we met him he was always the same, full of enthusiasm for his hobby, and overflowing with kindness and goodwill.' William Hodgson certainly had the power of stirring up the interest of others, and no doubt he felt that his special hobby was worthy of enthusiasm, for he would exclaim when it was doubted that a certain person would be interested in a ramble with him, 'We'll make him enjoy it, we'll make him enjoy it.' His letters (which, by the way, were written, even at the age of 76, with a clearness and steadiness that many a younger man might have envied) were full of energy and life, and to the very last he would write with unabated zeal of some

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'grand foray' he had made, or of some 'famous medley' of plants he had obtained. At times he would treat his botanical correspondents to various interesting odds and ends, perhaps to a quotation from, as he put it, 'my old friend Xenophon,' or, referring to some plant growing upon Helvellyn, to the following, 'I wonder if you ever heard the dalesmen's distich—

Skiddaw, Helvellyn, aud Catsticam
Are three biggest hills that ivver man clam,'

or, as he was fond of doing, to some information regarding the local names given to plants by children or by the dalesmen, for instance, writing of *Adoxa moschatellina* he would add, 'called by the youngsters of Carlisle the Town Hall Clock.' William Hodgson was a true Cumbrian of the Cumbrians, and he delighted to relate, with a liberal use of the Cumberland dialect, some one or other of his many angling experiences or botanical hunts. He bestowed particular attention upon the strange plants which appeared from time to time upon the ballast and rubbish cast out from ships around the docks at Silloth, Maryport, Workington, and elsewhere, and many a batch of botanical puzzles he sent to Kew for identification. It is interesting to note the amount of genuine pleasure that the sight of even the commonest plants afforded him; of the Sea Holly he wrote, 'How indescribably splendid is the Sea Holly just now on the west slope of Skinburness Grune,' and of *Menyanthes trifoliata* he wrote, 'It is the handsomest flower I have ever seen, native or foreign.'

William Hodgson was Botanical Recorder at one time to the Cumberland and Westmorland Association for the Advancement of Literature and Science. In his Record for 1887-8 he made the following commendable observation:—'A few new stations for ferns of comparative rarity have been kindly communicated to me, but, in view of the wholesale destruction of these interesting plants, I refrain from making them public.' He was elected an Associate of the Linnean Society of London in 1884. The following interesting letter is from Mr. J. G. Baker, F.R.S., of the Royal Herbarium at Kew, to the writer:—

'It was when staying at Penrith in 1884 to work at my 'Flora of the English Lake District' that I first made Mr. Hodgson's personal acquaintance through Mrs. Frank King. I went over to Watermillock to visit him, and we had a walk together along the shore of Ulleswater. Since then we have kept up a correspondence, and he has sent me every year specimens of the more interesting and difficult plants he

gathered. What impressed me about him was his geniality and wide range of knowledge. He took such an interest in so many things that he must have lived a happy life. I was always pleased that I had been instrumental in obtaining for him a place amongst the 50 Associates of the Linnean Society, and I feel very glad that before he died he was able to commit to print the information he had gathered during his long life about the plants of Cumberland. Now that I have more leisure than heretofore I shall greatly miss his letters, and to have been associated with him for so many years will remain with me as a pleasant memory.'

His 'Flora of Cumberland' (the first attempt to provide a complete flora of the county) was published just two years before his death, and it contains a vast amount of information of the greatest service to amateur botanists, for whom, he said, the book was specially compiled. As his observations, which were carried out in all the divisions of the county, extended over a period of more than half a century, it is scarcely to be wondered at, considering how diligent and persistent he was, that, out of the 1,200 plants recorded in his Flora, he had been able to verify for himself the existence of over 1,100 of them. In addition to his frequent contributions to 'The Naturalist' and other papers, a number of valuable articles (read originally before various scientific societies) were published in the 'Transactions of the Cumberland and Westmorland Association,' previously referred to. Of these articles the one entitled 'The Hill Naturalist' was regarded by himself as the most interesting; in it he referred in detail to the animals and the 'feathered occupants' of the hills as well as to the plants. Other articles were 'The Botany of the Solway Shore,' 'The Botany of the Caldew Valley' ('Canda's Sweet Vale'), 'The Flora of the Ulleswater District,' 'Botanical Waifs in Cumberland,' and 'The Grasses of Mid-Cumberland.' It is worthy of mention that in the 'Transactions of the Cumberland and Westmorland Antiquarian and Archæological Society' a paper appeared by him on 'A Century of 'Paines' or Local Government in the time of the Stuarts as illustrated by extracts from a Paine Book for the Hamlet of Weathermelock.' About the last work he did (and one might almost say a fitting work to close his life) was to write a summary of the botany of Cumberland for the 'Victoria History of the Counties of England.'

The present generation of local botanists can never forget the kindness, the enthusiasm, the humour, and the hearty goodwill of William Hodgson, the veteran botanist of Cumberland.

Carlisle, July 1901. WILLIAM THOMSON.

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NOTES on BIRDS.

Nightjar, etc., near Halifax.—I heard the Nightjar (*Caprimulgus europæus*) buzzing at Turvin on 19th July, and saw a great number of Golden Plovers (*Charadrius pluvialis*) on the 20th and 21st.—HAROLD PICKLES, 137, Hyde Park Road, Halifax, 27th July 1901.

Blue-pen: a Halifax Dialect Expression.—In the interesting paragraph on Cuckoo and Meadow-Pipit by Mr. Harold Pickles, Halifax, in last month's issue, there occurs the following: 'The young Cuckoo is now, as the country people say, in 'blue-pane,' i.e., its feathers are mostly in the quill stage.' The dialect expression is 'blue-pen' not blue-pane.—CHARLES CROSSLAND, 4, Coleridge Street, Halifax, 22nd August 1901.

Holderness Bird-Notes, May 1901.—On the occasion of the Hull Scientific Club's visit to Saltend, 23rd May, a Common Sandpiper (*Totanus hypoleucos*) was seen in the Hedon Haven, and three Stint (*Tringa alpina*) in summer plumage on Saltend Common. The Sandpiper usually visits us in April, and again in August and September. I have one other May record, Hornsea Mere, 3rd May 1895. My latest dates for the Stint are 26th May 1899, Saltend, and 21st June 1899, Hornsea Mere (2).

Swallows (*Hirundo rustica*) and House Martins (*Chelidon urbica*) were very numerous on the Humber bank, 23rd May. Correspondents who have noted a scarcity of these birds inland may possibly find a reason here, as this locality is a temporary resting place where they are found in numbers, in normal years, only at the end of April.—T. PETCH, Hedon, 14th June 1900.

Audacity of Lincolnshire Rooks.—During the last decade of dry springs and summers, Rooks (*Corvus frugilegus* L.) have grown unusually destructive. The following story, which happened 25th May 1901, in the Redland Carr, by the river Ancholme at Cadney, is about the coolest piece of work I have met with. Tom Hockney, the foreman at the Manor House, went out early in the morning along with the wagoner to horsehoe wheat. He had been very hurried and had very little breakfast before starting, and so took an unusually large luncheon. This was carefully wrapped up in white paper, and placed in the outer pocket of his greatcoat, from which a little of the white paper was visible. The coat was left lying on a bank in the shade, along with the wagoner's, folded with the luncheon pocket in the inside. While he was hoeing the foreman noticed an unusual gathering of Rooks in the neighbourhood of the coats, but did not give a second thought to the matter. At luncheon time he discovered his pocket had been ravaged by the boldfaced visitors. They had torn the paper into shreds in drawing it out of the coat pocket and devouring the food. As the luncheon was wholly covered with paper, the birds must have found the food out by smells. 'What's the good of a 'mawkin' [i.e. scarecrow] after that?' his master asked me. I have observed a Rook perched on the hat of a mawkin in order to get a better view of his feeding-ground.

During a snowy period some winters back at Cadney the Rooks drilled huge holes through the thatch of two wheat stacks, and feasted on the corn in sheaf. They varied their food with the flesh of dead Redwings, etc., which had been carried off by the cold. Two days after the stacks of wheat were thrashed I was much amused at seeing some twenty birds taking turns at the labour of drilling the thatch of a seed, i.e., clover and ryegrass, stack. After carrying on their unprofitable labour for three days the spot suddenly knew them no more. Had they made the discovery that stacks are not always built of wheat sheaves? The Rooks, both old and young, are starving this dry, hot weather. As I approached a farm the other day a hen cackled as she came off the nest. A Rook flew into the yard at once and carried out the egg on its bill and devoured it on the road about a hundred yards in front of me. Game birds' eggs are suffering terribly too.—E. ADRIAN WOODRUFFE-PEACOCK, Cadney, Brigg, 17th June 1901.

PEUCEDANUM PALUSTRE IN LAKE LANCASHIRE.

ARTHUR BENNETT, F.L.S.,
Croydon.

Looking through Winch's Herbarium at the Linnean Society, a few weeks ago, I found a specimen of the above species from Withering's herbarium, from the station given in the Botanist's Guide, 301, 1805, in Lake Lancashire. Neither Mr. Watson nor Mr. Baker, Lake Flora, 110, 1885, seem to have known of this specimen. Mr. Martindale (Westmorland Note Book, Natural History Record, 67, etc., 1888) does not notice the Westmorland record of the Guide (between Ambleside and Kendal, Mr. Jackson), although giving particulars of many old records. Mr. Petty asks, 'Naturalist,' p. 198, 1896, 'Can it have been the case here?' i.e., *Œnanthe Lachenalii* mistaken for it. The specimen is certainly *P. palustre* Mœnch, and so confirms the old record. Mr. F. A. Lees in the Flora of West Yorkshire, 260 (1888), says he saw it at Southport, Lancashire, in 1870. This would seem to remove counties 59 and 69 from the square enclosures in Top. Botany (i.e., as supposed errors). Of the other dubious counties Hereford is disposed of in the Flora of Hereford, 151 (1889). '61. York s. east.' I know of no confirmation of this. 76 Renfrew and 83 Edinburgh, though never confirmed, and treated as errors, are not impossible, as it is distributed all through Sweden up to Norland, and in South and North Norway, and Finland. Mr. Watson, Top. Bot., ed. 2, 201 (1883), puts a query to Essex, but Mr. Ray knew the plant well in Cambridgeshire. Beyond the records in Top. Botany, it was found last year by Messrs. Hilton and Druce in Sussex. This is a very likely county, as it formerly yielded the *Senecio palustris* L. (though not in the same place). In Rand's herbarium at the British Museum there is a specimen of the *Senecio* gathered in 1725 at 'Amberley,' by Dr. Manningham (who was rector of Slinfold for thirty-nine years). At this date Amberley Wild-Brooks must have been a deep morass.

Mr. Druce has recorded the *Peucedanum* as an alien in his Flora of Berkshire, 249 (1897), also in Journal of Botany, 308 (1891). No doubt as enclosures and drainage increase it will become rarer, but it still occurs in Somerset!, Norfolk!, Suffolk!, Cambridge!, and, I suppose, Lincoln and York. It may be extinct in Huntingdon, as the fens around Yaxley and Stilton are now all drained. In the Broad district in Norfolk it

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is still abundant and very fine. I saw a specimen growing on the opposite side of a dyke where *Senecio palustris* L. was plentiful; that measured 6 feet high.

A station that seems to have dropped out of notice is recorded in Hooker's Fl. Scotica, p. 88 (1821), i.e., ditch at Ardincaple Wood (Dumbartonshire), Hopkirk in Flora Glottiana (1813). This is repeated by Hooker and Arnott, Brit. Fl., ed. 8, p. 181 (1860), but not noticed by Mr. Watson. Hennedy, Clydesdale Flora, 75 (1878), remarks, 'This I have not seen.' It seems quite as likely (or more so) to have been correct as the other Scotch stations, but of course needs confirmation, either by old specimens or being re-discovered.

NOTES on YORKSHIRE PLANTS.

***Scirpus tabernæmontani* at Askern, Yorks. S.W.**—This plant—hitherto only recorded from 'ponds by the railway, Hook Grange, Hook Moor, near Goole; H. F. Parsons,' in 'Lees' Flora of West Yorkshire'—is plentiful in the bog at Askern. The list of sub-maritime plants that still linger in the low lands near Doncaster is very suggestive of the idea that the sea reached much further up the Don Valley in recent geological times than it does now. The following species all grow in one or more stations in the district:—*Trifolium fragiferum* L., *Samolus valerandi* L., *Plantago coronopus* L., *Glyceria distans* Wahlenb., besides the species named at the head of this note.—H. H. CORBETT, Doncaster, 10th August 1901.

Plant Names near Huddersfield: 'Mother Die,' etc.—I was much interested on reading Mr. Booth's note on the local name of 'Mother Die' given to *Anthriscus sylvestris*. I well remember in my younger days, when with other children gathering wild flowers, none of us would pluck the blossoms of the Greater Stitchwort (*Stellaria holostea*) to which we applied the name of 'Mother Die,' our belief being that if the flower was taken into our homes our mother would die. The superstition still lingers, for even now children fight shy of this pretty flower, and elder folk when making a wild bouquet seldom seem to include the blossoms of the Greater Stitchwort, although it is a common plant in our hedge-rows. I have never heard the name of 'Mother Die' applied to *Anthriscus sylvestris*, but the names of Humlock, Hemlock, and Rabbit Meat are quite common appellations here, especially the latter name.—W. E. L. WATTAM, Newsome, Huddersfield, 7th August 1901.

***Viola tricolor* in the North Riding of Yorkshire in 1685.**—In the recently issued Transactions of the Cumb. and Westm. Antiq. and Archæol. Soc., new series, Vol. I., 1901 (sent out to subscribers 24th June), the Bishop of Barrow-in-Furness prints a portion of the MS. Diaries of Bishop Nicolson, the friend of Lawson, and whose list of Cumberland plants was included by Ray in 1695 edition of Camden. On p. 30 Dr. Ware prints the following:—'1685, May 22. Homewards. *Flos Trinitarius* wild on ye marshes near Bowes; and of several colours.' I do not trace who he is following in the name, but the *Herba trinitatis* of Fuchs' History, 1542, and the *Jacea sive Flos Trinitatis* of Matthiolus' Commentarii, 1583, is *Viola tricolor* L. Cannot the Bishop give 'The Naturalist' these plant notes, for they must be worth something?—S. L. PETTY, Ulverston, 1st July 1901.

[We cordially re-echo this suggestion, and should indeed be pleased if the Bishop would favour 'The Naturalist' with such notes.—ED. Nat.]

LINCOLNSHIRE SPIDERS.

ARTHUR SMITH,

Hon. Secretary and Curator, Grimsby and District Naturalists' Society.

When I first commenced collecting Spiders I had not the slightest intention of publishing this or any other paper on the subject. In taking these animals my object was to assist in any little way I could in compiling records of our county's fauna. Up to quite recently the Register has been kept by that most industrious Lincolnshire naturalist, the Rev. E. A. Woodruffe-Peacock, but as his time is now so much taken up he has handed it over to me, to which I have already added many notes, and hope that from all parts of the county I may add many more. The whole of Mr. Peacock's notes are of Spiders which have passed through his hands; these were then forwarded to that greatest of arachnologists, the Rev. O. Pickard-Cambridge, or to his nephew, F. O. Pickard-Cambridge. The specimens which have gone through my own hands have been referred to these gentlemen or to Mr. F. P. Smith. So it will be seen that what has been done could only have been through the help of these specialists, who have most willingly agreed to authentically name specimens sent, and it is only by taking advantage of so kind an offer that I have been able to compile this list.

There is no up-to-date work on British Spiders. But two monumental works of industry can be recommended. First, John Blackwall's 'Spiders of Great Britain and Ireland,' Ray Society, 1861-64. Secondly, Rev. O. Pickard-Cambridge's 'Spiders of Dorset,' 1879-81, published by the Dorset Natural History and Antiquarian Field Club, with numerous supplementary papers in the Club Proceedings from 1882 to 1897.

Of the workers who have gone before, Mr. H. Wallis Kew's papers in 'The Naturalist'—especially the paper published in 1887, pp. 55-59—are well worth mentioning. The 1887 list was a very good piece of honest work, and as all Mr. Kew's specimens were verified by Rev. O. Pickard-Cambridge, they have been added to this list. I must also mention those well-illustrated papers by my friend, Mr. F. P. Smith, now appearing in 'Science-Gossip.'

Since commencing this paper, the Rev. O. Pickard-Cambridge has published a most acceptable and much-needed list of British and Irish Spiders, not only containing names and synonyms, but many useful notes on the subject.

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I have also to thank all those who have interested themselves by collecting, viz., Messrs. F. M. Burton, the late J. Cordeaux, W. Lewington, M. Peacock, R. Worsdale, C. B. Parker, R. T. Cassal, the Rev. H. C. Brewster and Rev. A. Thornley, but more especially Rev. E. A. Woodruffe-Peacock, who has been ever on the alert, and who is mainly responsible for this study being taken up in Lincolnshire at the present time. Regarding the bibliography he writes as follows :—

The bibliography I have been able to discover, thanks to my friend W. Denison Roebuck, F.L.S., is the following:—Anon., 'The Naturalist,' 1893, p. 172. Baker, W. F., 'The Naturalist,' 1893, pp. 261 and 312. Kew, H. Wallis, 'The Naturalist,' 1886, pp. 170-171; 1887, pp. 55-59; 1888, p. 329. 'Naturalist's World,' 1886, pp. 158, 161-162, 339. 'Entomologists' Monthly Magazine,' 1886, p. 136. 'Science Gossip,' 1887, p. 31. 'Young Naturalist,' 1887, pp. 57-61. Pickard-Cambridge, F. O., 'British Naturalist,' 1891, pp. 64, 65-70; 1892, pp. 93 and 96; 1893, pp. 121-122 and 131. Woodruffe-Peacock, Rev. E. A., 'The Naturalist,' 1898, pp. 244 and 264. There have also been several notes of occurrences in 'The Naturalist' from time to time, and there is also Mr. F. P. Smith's papers appearing in 'Science Gossip,' which I have before referred to.

Class ARACHNIDA.

Order ARANEIDEA (or ARANEÆ).

Family *DYSDERIDÆ*.

Dysdera cambridgii Thor. (*D. erythrina* Walck. Bl.).

N. 4. Irby, August 1899, A. Smith. 8. Louth, 1886, H. W. Kew.

S. 15. Grantham, 1898, L.N.U. Meeting.

Dysdera crocota Koch (*D. rubicunda* C.L.Koch. Bl.).

N. 4. The first record was made by my cousin, Mr. J. Harris, who found it among garden rubbish, 1898. Irby, September 1900, C. B. Parker.

S. 13. Court Leys, 1900, Miss S. C. Stow.

Harpactes hombergii Scop. (*Dysdera hombergii* Walck. Bl.).

N. 4. Irby, February 1901, C. B. Parker. 8. Louth, 1886, H. W. Kew. 9. Mablethorpe, 1886, H. W. Kew.

S. 15. Grantham, 1898, L.N.U. Meeting.

Segestria senoculata Linn.

N. 3. Cadney, 1898, E. A. W. Peacock. 8. Louth (Hubbards Hills), 1886, H. W. Kew.

Oonops pulcher Templ.

N. 4. Mr. Parker, of the Grimsby and District Naturalists' Society, recently found this rare species at Irby in fair numbers, 1901.

Family *DRASSIDÆ.*

Drassus lapidosus Walck. (*Drassus lapidicolens* Walck. Bl.).

N. 8. Louth, 1886, H. W. Kew. 9. Mablethorpe, 1886, H. W. Kew.

Drassus cupreus Bl.

N. 9. North Somercotes, 1899, E. A. W. Peacock.

Drassus sylvestris Bl. (*D. infuscatus* Westr. Cambr.). (*D. criminalis* Cambr.)

N. 2. Manton, 1898, E. A. W. and Max Peacock.

Drassus blackwallii Thor. (*D. sericeus* Walck. Bl.).

N. 3. Cadney, 1898, E. A. W. and Max Peacock. 4. Grimsby, June 1899, A. Smith. Irby, September 1900, C. B. Parker. 8. Louth, 1886, H. W. Kew.

S. 15. Grantham, 1898, L.N.U. Meeting.

Clubiona terrestris Westr. (*C. amarantha* Bl.).

N. 3. Cadney, 1898, E. A. W. and Max Peacock. 4. Great Cotes, 1898, E. A. W. Peacock and J. Cordeaux.

S. 15. Grantham, 1898, R. Worsdale.

Clubiona reclusa Cb.

N. 3. Cadney, 1898, E. A. W. and Max Peacock. 7. South Kelsey, 1898, E. A. W. Peacock and H. C. Brewster.

Clubiona lutescens Westr.

N. 3. Cadney, 1898, E. A. W. and Max Peacock.

Clubiona neglecta Cb.

N. 9. North Somercotes, 1899, E. A. W. Peacock.

Rev. O. Pickard-Cambridge notes this record as rare.

Clubiona holosericea De Geer. (*C. deinognatha* Cambr.).

N. 4. Grimsby, August 1900, A. Smith. 8. Louth, 1886, H. W. Kew.

Clubiona pallidula Clk. (*C. epimelas* Bl.).

N. 2. Broughton, 1900, E. A. W. Peacock. 3. Cadney, 1898, E. A. W. and Max Peacock. 4. Clee, Holton, Waltham, Brigsley, Ashby, Irby, Aylesby, A. Smith and C. B. Parker.

S. 15. Grantham, 1898, R. Worsdale.

Clubiona trivialis L. Koch.

N. 1. Isle of Axholme, 1898, E. A. W. Peacock. 5. Scotton Common, 1898, E. A. W. and Max Peacock.

Clubiona brevipes Bl.

N. 3. Cadney, 1898, E. A. W. and Max Peacock. 4. Bradley, July 1898, A. Smith. 5. Scotton Common, 1898, E. A. W. Peacock and J. Cordeaux. 7. Market Rasen, 1898, W. Lewington. 8. Burwell Wood, 1885, H. W. Kew. Louth, 1886, H. W. Kew.

S. 13. Hartsholme, 1898, W. Lewington.

Clubiona comta C. L. Koch.

N. 3. Cadney, 1898, E. A. W. Peacock. 8. Maltby Wood, 1886, H. W. Kew.

S. 13. Court Leys, 1900, Miss Stow.

Chiracanthium lapidicolens Sim. (*C. nutrix* Westr. Cambr.).

N. 5. Scotton Common, 1898, E. A. W. and Max Peacock. An immmature specimen of a 'rare and local' species—Rev. O. P. Cambridge.

Anyphœna accentuata Walck. (*Clubiona accentuata* Walck. Bl.).

N. 2. Broughton, 1900, E. A. W. Peacock. 3. Cadney, 1898, E. A. W. and Max Peacock. 7. Market Rasen, 1898, W. Lewington. 8. Burwell Wood, 1886, H. W. Kew. 10. Tumby Wood, 1898, E. A. W. Peacock.

S. 13. Court Leys, 1900, Miss Stow.

Family *DICTYNIDÆ*.

Dictyna arundinacea L. (*Ergatis benigna* Bl.).

N. 1. Isle of Axholme, 1898, E. A. W. Peacock. 2. Manton, 1898, E. A. W. and Max Peacock. 3. Cadney, 1898, E. A. W. and Max Peacock. 4. Great Cotes, 1898, E. A. W. Peacock and J. Cordeaux. 5. Scotton Common, 1898, E. A. W. and Max Peacock. 7. Linwood, 1898, E. A. W. and Max Peacock. 10. Tumby Wood, 1898, E. A. W. Peacock.

S. 13. Hartsholme, 1898, L.N.U. Meeting.

Dictyna uncinata Westr.

N. 3. Cadney, 1898, E. A. W. and Max Peacock. 4. Grimsby, August 1900, A. Smith. 8. Louth, 1886, H. W. Kew.

S. 13. Court Leys, 1889, Miss Stow.

Dictyna latens Fabr.

(*D. lugubris* Cambr.). (*Ergatis latens* C.L.Koch. Bl.).

N. 4. Irby, 13th September 1900, C. B. Parker.

Lethia humilis Bl. (*Ciniflo humilis* Bl.).

N. 3. Cadney, March 1898, E. A. W. and Max Peacock.

Amaurobius ferox Walck.

(*Ciniflo ferox* Walck. Bl.). (*C. mordax* Bl.).

N. 8. Louth, 1886, H. W. Kew.

S. 13. Court Leys, 1900, Miss Stow. 15. Grantham, 1898, L.N.U. Meeting.

Amaurobius similis Bl. (*Ciniflo similis* Bl.).

N. 3. Cadney, 1898, E. A. W. and Max Peacock. 4. Great Cotes, 1899, J. Cordeaux. Irby, Clee, Holton, Waltham, Brigsley, Ashby, 1899, A. Smith. 9. North Somercotes, 1899, E. A. W. Peacock.

S. 13. Court Leys, 1900, Miss Stow. 15. Grantham, 1898, L.N.U. Meeting.

Amaurobius fenestralis Stroem. (*Ciniflo atrox* Walck. Bl.).

N. 4. Clee, Grimsby, September 1900, A. Smith. Irby, January 1901, C. B. Parker. 7. Linwood, 1898, E. A. W. and Max Peacock. 8. Louth, 1886, H. W. Kew. 9. Mablethorpe, 1886, H. W. Kew.

Family *AGELENIDÆ*.

Cryphœca silvicola C.L.Koch (*Tegenaria silvicola* Walck. Bl.). (*Agelena hyndmanii* Templ. Bl.)

N. 8. Burwell and Haugham Woods, 1886, Messrs. Roebuck and Kew.

Cœlotes atropos Wlk. (*C. saxatilis* Bl.).

N. 8. Maltby Wood, 1886, H. W. Kew.

Argyroneta aquatica Clk.

N. 2. Bottesford, 1873-84, E. A. W. Peacock. Broughton, 1899, E. A. W. Peacock. 3. Cadney and Newstead, 1899, E. A. W. Peacock. 4. Great Cotes, 1898, J. Cordeaux and E. A. W. Peacock. Grimsby, June 1899, A. Smith. 6. Marton, 1893-98, Rev. A. Thornley. 9. Mablethorpe, 1888, H. W. Kew. 11. Ingoldmells, 1899, E. A. W. Peacock.

S. 18. Spalding, 1888, H. W. Kew.

Agelena labyrinthica Clk.

N. 9. Saltfleetby, 1886, H. W. Kew. Mablethorpe, 1899, A. Smith. 10. Woodhall Spa, 1893, W. F. Baker.

Family *THERIDIIDÆ.*

Theridion sisyphium Clk. (*T. nervosum* Bl.).

N. 2. Manton, April 1898, E. A. W. and Max Peacock. 3. Cadney, April 1898, E. A. W. and Max Peacock. 4. Ravendale, June 1899, A. Smith. Irby, Limber, 1900, C. B. Parker. 5. Scotton Common, 1898, E. A. W. Peacock and J. Cordeaux. Gainsborough, 1898, E. A. W. Peacock. 7. Linwood, 1898, E. A. W. Peacock. 8. Louth, 1886, H. W. Kew.

S. 13. Hartsholme, 1898, W. Lewington. 15. Grantham, L.N.U. Meeting.

Theridion pulchellum Walck.

N. 3. Cadney, April 1898, E. A. W. and Max Peacock. 4. Great Cotes, June 1898, E. A. W. Peacock and J. Cordeaux. Grimsby, August 1900, A. Smith. 7. Linwood, May 1898, E. A. W. and Max Peacock. Market Rasen, 1898, W. Lewington.

Theridion denticulatum Walck.

N. 2. Manton, 1898, E. A. W. and Max Peacock. 3. Cadney, 1898, E. A. W. and Max Peacock. 4. Great Cotes, 1898, E. A. W. Peacock and J. Cordeaux. 5. Kirton, 1898, W. Lewington. 8. Louth, 1886, H. W. Kew. Maltby Wood, 1886, H. W. Kew.

Theridion familiare Cb.

S. 13. Court Leys, 1899, Miss Stow.

Theridion varians Hahn.

N. 2. Manton, 1898, E. A. W. and Max Peacock. 3. Cadney, 1898, E. A. W. and Max Peacock. 4. Great Cotes, 1898, E. A. W. Peacock and J. Cordeaux. Irby, September 1900, C. B. Parker. 8. Louth, 1886, H. W. Kew. 10. Tumby Wood, 1898, E. A. W. Peacock.

S. 13. Hartsholme, 1898, L.N.U. Meeting. Court Leys, 1899, Miss Stow.

Theridion tinctum Wlk.

N. 3. Cadney, May 1897, E. A. W. Peacock. 7. Linwood, May 1898, E. A. W. Peacock and Max Peacock.

Theridion pictum Hahn.

S. 15. Grantham, 1898, L.N.U. Meeting.

Theridion tepidariorum Koch.

N. 4. Grimsby, August 1900, A. Smith. 5. Gainsborough, 1898, E. A. W. Peacock. 7. South Kelsey, 1898, Rev. H. C. Brewster.

S. 13. Court Leys, 1899, Miss Stow. 15. Grantham, 1898, L.N.U. Meeting.

Introduced from abroad, and now naturalised in almost every greenhouse, conservatory, and hothouse in the country.

Theridion bimaculatum L. (*T. carolinum* Bl.).

N. 3. Cadney, May 1898, E. A. W. and Max Peacock. 4. Ravendale, July 1899, A. Smith. 8. Near Louth, 1886, H. W. Kew.

Theridion pallens Bl. (*T. albens* Bl.).

N. 2. Manton, 1898, E. A. W. and Max Peacock. 3. Cadney, 1898, E. A. W. and Max Peacock.

Phyllonethis lineata Clk. (*Theridion lineatum* Bl.).

N. 2. Ashby, 1898, R. T. Cassal. 3. Cadney, April 1898, E. A. W. and Max Peacock. 4. Irby, Ravendale, 1899, A. Smith. Waltham, September 1900, Brocklesby, Keelby, Habrough, Smith and Parker. 7. Market Rasen, 1898, W. Lewington. 8. Louth, 1886, H. W. Kew.

S. 13. Court Leys, 1899, Miss Stow. 15. Grantham, 1898, R. Worsdale.

Phyllonethis lineata var. ***redimitum*** C.L.Koch.

N. 4. Bradley, 1898, A. Smith.

S. 13. Court Leys, 1899, Miss Stow.

Steatoda bipunctata L. (*Theridion quadripunctatum* Walck. Bl.).

N. 3. Cadney, 1898, E. A. W. and Max Peacock. 4. Irby, February 1901, C. B. Parker. 5. Greyingham, 1898, Max Peacock. 8. Louth, 1886, H. W. Kew. 9. Mablethorpe, 1886, H. W. Kew.

S. 13. Court Leys, 1899, Miss Stow. 15. Grantham, 1898, L.N.U. Meeting.

Pedanostethus lividus Bl. (*Neriene livida* Bl.).

N. 3. Cadney, 1898, E. A. W. Peacock.

S. 15. Grantham, 1898, L.N.U. Meeting.

Bolyphantes bucculentus Clerck (*Linyphia frenata* Wid.).

N. 7. South Kelsey, 1898, Revs. Brewster and Peacock.

Drapetisca socialis Sund. (*Linyphia socialis* Sund. Cambr.).

N. 4. Brocklesby, Keelby, Habrough, September 1900, Smith and Parker. 8. Welton Vale, 1886, H. W. Kew.

Stemonyphantes lineata Linn.

(*Linyphia bucculenta* Clk.). (*Neriene trilineata* Bl.).

N. 3. Cadney, 1898, E. A. W. Peacock. Limber, 1898, A. Smith. 4. Irby, 1899, A. Smith. Clee, Holton, Waltham,

Brigsley, Ashby, September 1900, A. Smith. 8. Donington-on-Bain, 1886, H. W. Kew. 9. Mablethorpe, 1886, H. W. Kew. 11. Ingoldmells, 1899, E. A. W. Peacock.

S. 15. Grantham, 1898, L.N.U. Meeting.

Linyphia insignis Bl.

N. 5. Gainsborough, 1898, E. A. W. Peacock. 7. Market Rasen, 1898, W. Lewington. Newball, 1899, E. A. W. Peacock. 8. Welton Vale, 1886, H. W. Kew.

Linyphia montana Clk. (*Linyphia marginata* Bl.).

N. 3. Broughton, 1900, E. A. W. Peacock. Cadney, 1898, E. A. W. Peacock. 4. Irby, September 1900; Aylesby, November 1900, C. B. Parker. 7. Newball, 1899, E. A. W. Peacock. 8. Louth, 1886, H. W. Kew.

S. 13. Court Leys, 1900, Miss Stow. 15. Grantham, 1898, L.N.U. Meeting.

Linyphia triangularis Clk. (*L. montana* Walck. Bl.).

N. 3. Cadney, 1898, E. A. W. Peacock and Max Peacock. 4. Ravendale, Irby, 1899, Clee, Waltham, Brocklesby, Keelby, Habrough, Smith and Parker. 5. Gainsborough, 1898, E. A. W. Peacock. 7. Newball, 1899, E. A. W. Peacock. 10. Tumby Wood, 1898, E. A. W. Peacock.

S. 13. Hartsholme, 1898, L.N.U. Meeting.

Linyphia peltata Wid. (*L. rubea* Bl.).

N. 2. Manton, 1898, E. A. W. and Max Peacock. 3. Cadney, 1898, E. A. W. and Max Peacock. 4. Bradley, 1898, A. Smith. Irby, May 1900, C. B. Parker. 5. Gainsborough, 1898, E. A. W. Peacock. 7. Linwood, 1898, E. A. W. and Max Peacock.

Linyphia impigra Cambr. (*L. circumcincta* Cambr.).

N. 4. Great Cotes, 1898, E. A. W. Peacock and J. Cordeaux. A local species.

Linyphia pusilla Sund. (*L. fuliginea* Bl.).

N. 2. Broughton, 1900, E. A. W. Peacock. 3. Cadney, 1898, E. A. W. Peacock. 4. Aylesby, 1899, Thornley and Peacock. Ravendale, 1899, A. Smith.

S. 13. Court Leys, 1900, Miss Stow.

Linyphia hortensis Sund. (*L. pratensis* Wid.).

N. 3. Cadney, 1898, E. A. W. and Max Peacock. 4. Irby, 1899, Grimsby, 1900, A. Smith. 7. Linwood, 1898, E. A. W. and Max Peacock. Market Rasen, 1898, W. Lewington. 8. Maltby Wood, 1886, H. W. Kew.

Linyphia clathrata Sund. (*Neriene marginata* Bl.).

N. 2. Broughton, 1900, E. A. W. Peacock.. 3. Cadney, 1898, E. A. W. Peacock. 4. Great Cotes, March 1899, A. Smith. Irby, September 1900, C. B. Parker. 5. Gainsborough, 1898, E. A. W. Peacock. 8. Louth, 1886, H. W. Kew.

Leptyphantes minutus Bl.

N. 3. Cadney, 1898, E. A. W. Peacock. 4. Brocklesby, Keelby, Habrough, September 1900, Smith and Parker. Irby, Aylesby, November 1900, Smith and Parker. 8. Louth, 1886, H. W. Kew.

Leptyphantes nebulosus Sund. (*Linyphia vivax* Bl.).

N. 4. Clee, September 1900, A. Smith. Irby, February 1901, C. B. Parker. 8. Louth, 1886, H. W. Kew.

Leptyphantes terricola Koch. (*Linyphia alacris* Bl.).

N. 3. Cadney, 1898, E. A. W. and Max Peacock.

Leptyphantes obscurus Bl. (*Linyphia obscura* Bl. Cambr.).

N. 3. Cadney, 1898, E. A. W. Peacock.

Leptyphantes tenuis Bl.

(*Linyphia tenebricola* Bl. Cambr.). (*L. tenuis* Bl.)

N. 3. Cadney, 1899, E. A. W. Peacock. 4. Grimsby, Waltham, Irby, 1900, Smith and Parker. Great Cotes, 1898, Peacock and Cordeaux.

S. 15. Grantham, 1898, L.N.U. Meeting.

Leptyphantes tenebricola Wid.

N. 4. Irby, February 1901, C. B. Parker.

Bathyphantes variegatus Bl.

(*Linyphia variegata* Bl. Cambr.). (*Neriene variegata* Bl.).

N. 3. Cadney, 1898, E. A. W. Peacock.

Bathyphantes concolor Wid.

(*Linyphia concolor* Wid. Cambr.). (*Theridion filipes* Bl.)

N. 3. Cadney, 1898, E. A. W. Peacock. 4. Great Cotes, March 1899, A. Smith.

Bathyphantes pullatus Cambr. (*Linyphia pullata* Cambr.).

N. 3. Cadney, 1898, E. A. W. Peacock.

Bathyphantes parvulus Westr.

(*Linyphia parvula* Westr. Cambr.).

N. 4. Great Cotes, 1898, E. A. W. Peacock and J. Cordeaux.

Bathyphantes gracilis Bl.
(*Linyphia gracilis* Bl. Cambr.). (*L. circumspecta* Bl.).
N. 3. Cadney, 1898, E. A. W. and Max Peacock. 4. Great Cotes, 1898, E. A. W. Peacock and J. Cordeaux.

Bathyphantes dorsalis Wid.
(*Linyphia dorsalis* Wid. Cambr.). (*L. claytoniæ* Bl.).
N. 3. Cadney, 1898, E. A. W. Peacock. 5. Gainsborough, 1898, E. A. W. Peacock.
S. 13. Court Leys, 1899, Miss Stow.

Tmeticus rufus Wid.
(*Neriene rufa* Wid. Cambr.). (*N. rubripes* Bl.)
N. 3. Cadney, 1898, E. A. W. Peacock.

Microneta viaria Bl.
N. 3. Cadney, 1898, E. A. W. and Max Peacock.

Microneta rurestris C.L.Koch. (*N. flavipes* Bl.)
(*Neriene fuscipalpis* C.L.Koch. Cambr.). (*N. gracilis* Bl.)
N. 5. Kirton, 1898, E. A. W. Peacock.

Gongylidium graminicolum Bl.
(*Neriene graminicola* Bl. Cambr.).
N. 3. Cadney, 1898, E. A. W. and Max Peacock. 7. Linwood, 1898, E. A. W. and Max Peacock. 9. North Somercotes, 1899, E. A. W. and Max Peacock.

Gongylidium rufipes Sund.
(*Neriene rufipes* Sund. Cambr.). (*N. munda* Bl.)
N. 4. Grimsby, August 1900, A. Smith. 8. Louth, 1886, H. W. Kew.

Gongylidium dentatum Wid. (*Neriene dentata* Wid.).
N. 7. South Kelsey, 1898, Revs. Brewster and Peacock. 11. Ingoldmells, 1899, E. A. W. Peacock.
S. 13. Court Leys, 1899, Miss Stow.

Erigone longipalpis Sund. (*Neriene longipalpis* Sund. Cambr.).
N. 4. Irby, 1901, C. B. Parker.

Erigone dentipalpis Wid. (*Neriene dentipalpis* Wid.).
N. 4. Great Cotes, 1898, E. A. W. Peacock and J. Cordeaux.

Erigone atra Bl. (*Neriene atra* Bl.). (*N. longipalpis* Sund.).
N. 3. Cadney, 1898, E. A. W. Peacock.
S. 15. Grantham, 1898, R. Worsdale.

Neriene rubens Bl.

N. 3. Cadney, 1898, Revs. Thornley and Peacock. 4. Clee, Holton, Waltham, Brigsley, Ashby, 13th September 1900, A. Smith. 8. Louth, 1886, H. W. Kew.

S. 15. Grantham, 1898, L.N.U. Meeting.

Neriene rubella Bl. (*N. isabellina* C.L.Koch).

N. 3. Cadney, 1898, E. A. W. and Max Peacock.

Dicyphus bituberculatus Wid. (*Neriene bituberculata* Wid.).

N. 7. Linwood, 1898, E. A. W. and Max Peacock.

Dismodicus bifrons Bl. (*Walckenaëra bifrons* Bl.).

N. 3. Cadney, 1898, E. A. W. and Max Peacock.

Diplocephalus speciosus Cb. (*Plœsiocrœrus speciosus* Cb.).

N. 3. Cadney, 1898, E. A. W. and Max Peacock. A second record for England.

Savignia frontata Bl.

N. 4. Irby, 1900, C. B. Parker.

Pocadicnemis pumilus Bl. (*Walckenaëra pumila* Bl. Cambr.).

N. 4. Great Cotes, 1898, E. A. W. Peacock and J. Cordeaux.

Walckenaera acuminata Bl.

N. 8. Haugham Chalk Pit, 1886, H. W. Kew.

Cornicularia cuspidata Bl.

(*Walckenaëra cuspidata* Bl. Cb.). (*W. clara* Cambr.)

N. 3. Cadney, 1898, E. A. W. Peacock.

Family *MIMETIDÆ.*

Ero thoracica Wid. (*Theridion variegatum* Bl.).

N. 8. Louth, 1886, H. W. Kew.

Family *EPEIRIDÆ.*

Tetragnatha extensa L.

N. 2. Hibaldstow, 1898, E. A. W. Peacock. Broughton, 1900, E. A. W. Peacock. 3. Cadney, 1898, E. A. W. Peacock. 4. Great Cotes, 1898, Cordeaux and Peacock. Ravendale, 1899, A. Smith. Irby, Grimsby, Brocklesby, Keelby, Habrough, Aylesby, 1900, Smith and Parker. 7. Linwood, 1898, E. A. W. and Max Peacock. 8. Louth, 1886, H. W. Kew. 9. Saltfleet, 1886, H. W. Kew.

S. 13. Court Leys, 1900, Miss Stow. 15. Grantham, 1898, L.N.U. Meeting.

1901 September 2.

Tetragnatha solandrii Scop.

N. 2. Broughton, 1900, E. A. W. Peacock. 3. Cadney, 1900, E. A. W. Peacock. 4. Irby, 1900, C. B. Parker.

S. 13. Court Leys, 1900, Miss Stow.

Tetragnatha obtusa Koch.

N. 2. Manton, 1898, E. A. W. and Max Peacock. 3. Cadney, 1898, E. A. W. and Max Peacock. 7. Linwood, 1898, E. A. W. and Max Peacock.

Tetragnatha pinicola Koch.

N. 7. South Kelsey, July 1898, E. A. W. Peacock. A rare species.

Pachygnatha degeerii Sund.

N. 3. Cadney, 1898, E. A. W. and Max Peacock. 4. Great Cotes, 1898, Peacock and Cordeaux. Clee, Irby, Waltham, Brocklesby, Keelby, Habrough, September 1900, Smith and Parker. 8. Louth, 1886, H. W. Kew. 11. Ingoldmells, 1899, E. A. W. Peacock. 12. Frieston, 1899, H. Preston.

S. 13. Hartsholme, 1898, W. Lewington.

Pachygnatha clerckii Sund.

N. 2. Hibaldstow, 1898, E. A. W. Peacock. 3. Cadney, 1898, E. A. W. and Max Peacock. 4. Great Cotes, Irby, 1898, A. Smith.

S. 13. Court Leys, 1900, Miss Stow. 15. Grantham, 1898, R. Worsdale.

Pachygnatha listeri Sund.

N. 3. Cadney, 1898, E. A. W. Peacock. 7. Newball Wood, 1899, E. A. W. Peacock.

Meta segmentata Clk. (*Epeira inclinata* Wlk.). (*E. mengii* Bl.).

N. 2. Broughton, 1900, E. A. W. Peacock. 3. Cadney, 1898, E. A. W. Peacock. 4. Great Cotes, Grimsby, Irby, Ravendale, 1898, A. Smith. Waltham, Clee, Brocklesby, Keelby, Habrough, Holton, Brigsley, Ashby, Aylesby, 1900, Smith and Parker. 5. Kirton, Cleatham, 1898, E. A. W. Peacock. 7. Market Rasen, 1898, W. Lewington. Linwood, South Kelsey, 1898, E. A. W. Peacock. Newball, 1899, H. Preston. 8. Louth, 1886, H. W. Kew. 10. Tumby Wood, 1898, E. A. W. Peacock. 12. Frieston, 1899, H. Preston.

S. 13. Court Leys, 1899, Miss Stow. Hartsholme, 1898, L.N.U. Meeting.

Meta merianæ Scop. (*Epeira antriada* Walck.). (*E. celata* Bl.).

N. 3. Cadney, 1898, E. A. W. and Max Peacock. 4. Ravendale, 1899; Grimsby, 1900, A. Smith. 8. Louth, 1886, H. W. Kew. 9. Mablethorpe, 1886, H. W. Kew.

S. 15. Grantham, 1898, L.N.U. Meeting.

Cyclosa conica Pallas (*Epeira conica* Wlk.).

N. 3. Cadney, 1898, E. A. W. Peacock. 4. Irby, 1900, C. B. Parker. 7. Newball Wood, 1899, E. A. W. Peacock.

Zilla x-notata Clk. (*Epeira similis* Bl.).

N. 3. Cadney, 1898, E. A. W. and Max Peacock. 4. Grimsby, 1898, A. Smith. Irby, 1900, C. B. Parker. 5. Scotton Common, 1898, E. A. W. and Max Peacock. Kirton, 1898, E. A. W. Peacock. Gainsborough, 1898, E. A. W. Peacock 7. Market Rasen, 1898, W. Lewington. 8. Louth, 1886, H. W. Kew. 12. Frieston, 1899, W. Preston.

S. 13. Hartsholme, 1898, L.N.U. Meeting. 15. Court Leys, 1900, Miss Stow. Grantham, 1898, L.N.U. Meeting.

Zilla atrica C.L.Koch (*Epeira calophylla* C.L.Koch. Bl.).

N. 4. Irby, August 1899, A. Smith. Clee, Grimsby, Holton, Waltham, Brigsley, Ashby, 1900, A. Smith. 8. Louth, 1886, H. W. Kew. 9. Mablethorpe, 1886, H. W. Kew.

S. 13. Hartsholme, 1898, W. Lewington. Court Leys, 1898, Miss Stow.

Epeira gibbosa Walck.

(*E. arbustorum* C.L.Koch). (*E. bicornis* Walck.).

N. 2. Broughton, 1900, E. A. W. Peacock. 3. Cadney, 1900, E. A. W. Peacock. 10. Tumby Wood, 1898, E. A. W. Peacock.

Epeira pyramidata Clk. (*E. scalaris* Clk.).

N. 4. Irby, February 1900, C. B. Parker. 8. Authorpe, Burwell Wood, 1886, H. W. Kew. 10. Tumby Wood, 1898, E. A. W. Peacock.

S. 16. Bourne Wood, 1887, H. W. Kew.

Epeira marmorea Clk.

N. 10. Tumby Wood, 1898, E. A. W. Peacock.

Rev. O. P. Cambridge makes the following note regarding this specimen:—The identity of this spider, being immature, is uncertain. The next species (*Epeira pyramidata*) (*Araneus*) is generally considered to be a variety of *E. marmorea*. The true *marmorea*, however, in the adult

state, has not yet been recorded in Britain, where the form *pyramidata* is very generally distributed though not abundant.

Epeira diademata Clk. (*E. diadema* Walck.).

N. 2. Manton, 1898; Broughton, 1900, E. A. W. Peacock. 3. Cadney, 1900, E. A. W. Peacock. 4. Great Cotes, 1898, A. Smith. Aylesby, Irby, Scatho, Little Cotes, 1899, A. Smith. Waltham, Clee, Brocklesby, Keelby, Habrough, Holton, Brigsley, Ashby, 1900, Smith and Parker. 5. Scotton Common, 1898, E. A. W. and Max Peacock. 7. Linwood, 1898, E. A. W. and Max Peacock. Market Rasen, 1898, W. Lewington. South Kelsey, 1898, Revs. Brewster and Peacock. Newball, 1899, E. A. W. Peacock. 8. Louth, 1886, H. W. Kew. 9. Conisholme, 1899, E. A. W. Peacock.

S. 13. Hartsholme, 1898, L.N.U. Meeting. 15. Grantham, 1898, L.N.U. Meeting.

Epeira cucurbitina Clk.

N. 2. Manton, 1898, E. A. W. and Max Peacock. Hibaldstow, 1898, E. A. W. and Max Peacock. 3. Cadney, 1898, E. A. W. and Max Peacock. 4. Great Cotes, 1898, Peacock and Cordeaux. Ravendale, Irby, 1899, A. Smith. Grimsby, 1900, A. Smith. 5. Scotton Common, 1898, Cordeaux and Peacock. 7. South Kelsey, 1898, E. A. W. Peacock. Market Rasen, 1898, W. Lewington. Linwood, 1898, E. A. W. and Max Peacock. 8. Burwell Wood, 1886, H. W. Kew.

S. 13. Hartsholme, 1898, W. Lewington. Court Leys, 1900, Miss Stow. 15. Grantham, 1898, L.N.U. Meeting.

Epeira triguttata Fabr.

(*E. agalena* Walck. Cb.). (*E. youngii* Cambr.).

N. 4. Great Cotes, 1898, E. A. W. Peacock and John Cordeaux. 7. Market Rasen, 1898, W. Lewington.

Epeira redii Scop. (*E. sollers* Walck.). (*E. solers* Walck.).

N. 7. Linwood, 1898, E. A. W. and Max Peacock. 10. Tumby Wood, 1898, E. A. W. Peacock.

Epeira umbratica Clk.

N. 3. Cadney, 1898, E. A. W. and Max Peacock. 4. Great Cotes, 1898, J. Cordeaux. Irby, Waltham, Clee, 1900, C. B. Parker. 8. Louth, 1886, H. W. Kew. 12. Freiston, 1899, H. Preston.

S. 13. Hartsholme, 1898, E. A. W. Peacock. Court Leys, 1900, Miss Stow.

Epeira quadrata Clk.

N. 1. Isle of Axholme, 1898, E. A. W. Peacock. 5. Scotton Common, Cleatham, 1898, E. A. W. and Max Peacock. 7. Linwood, 1897, E. A. W. and Max Peacock. 8. Louth, 1886, H. W. Kew. 9. Mablethorpe, 1886, H. W. Kew. 10. Tumby Wood, 1886, E. A. W. Peacock. 12. Frieston, 1899, H. Preston.

Epeira cornuta Clk. (*E. apoclisa* Walck. Bl.).

N. 2. Broughton, 1900, E. A. W. Peacock. 3. Cadney, 1898, E. A. W. and Max Peacock. 4. Grimsby, August 1900, A. Smith. Great Cotes, 1898, Peacock and Cordeaux. 7. Linwood, South Kelsey, 1898, E. A. W. and Max Peacock. 8. Louth canal, 1886, H. W. Kew. 9. Mablethorpe, Saltfleet, Saltfleetby, 1886, H. W. Kew.

S. 13. Hartsholme, 1898, L.N.U. Meeting. 17. Gosberton, 1887, H. W. Kew.

Family *THOMISIDÆ.*

Misumena vatia Clk. (*Thomisus citreus* Walck.).

N. 8. Maltby Wood, 1886, H. W. Kew.

Diæa dorsata Fabr. (*Thomisus floricolens* Bl.).

N. 10. Tumby Wood, 1898, E. A. W. Peacock.

Xysticus cristatus Clk. (*Thomisus cristatus* Bl.).

N. 2. Manton, Hibaldstow, 1898, E. A. W. and Max Peacock. 3. Cadney, 1898, E. A. W. and Max Peacock. 4. Great Cotes, 1898, E. A. W. Peacock and J. Cordeaux. Irby, September 1900, C. B. Parker. Clee, Grimsby, Holton, Waltham, Brigsley, Ashby, September 1900, A. Smith. 5. Scotton Common, Cleatham, 1898, E. A. W. and Max Peacock. 8. Louth, Burwell Wood, 1886, H. W. Kew. 9. North Somercotes, 1899, E. A. W. Peacock.

S. 13. Hartsholme, 1898, L.N.U. Meeting. Court Leys, 1900, Miss Stow.

Xysticus pini Hahn. (*Thomisus audax* Koch. Bl.).

N. 3. Cadney, 1898, A. Thornley, E. A. W. and Max Peacock. 8. Muckton, Maltby Woods, 1886, H. W. Kew. 10. Tumby Wood, 1898, E. A. W. Peacock.

Xysticus lanio Koch.

N. 2. Broughton, 1900, E. A. W. Peacock. 3. Cadney, 1900, E. A. W. Peacock. 7. Newball, 1899, E. A. W. Peacock. 8. Maltby Wood, 1886, H. W. Kew.

Xysticus erraticus Bl. (*Thomisus erraticus* Bl.).

N. 3. Limber, 1898, A. Smith. 7. Linwood, E. A. W. and Max Peacock.

Xysticus ulmi Hahn. (*Thomisus westwoodii* Cambr.).

N. 4. Great Cotes, 1898, E. A. W. Peacock and J. Cordeaux. 7. Newball, 1899, E. A. W. Peacock. 8. Maltby Wood, 1886, H. W. Kew.

Oxyptila atomaria Panz.

(*Thomisus versutus* Bl.). (*T. pallidus* Bl.).

N. 5. Scotton Common, 1898, E. A. W. and Max Peacock. 8. Louth, 1886, H. W. Kew.

Oxyptila praticola Koch (*Thomisus incertus* Bl.).

N. 8. Louth, 1886, H. W. Kew.

S. 15. Grantham, 1898, R. Worsdale.

Philodromus dispar Walck.

N. 4. Irby, September 1900, C. B. Parker. 7. Newball Wood, 1899, E. A. W. Peacock.

S. 13. Court Leys, 1899, Miss Stow.

Philodromus aureolus Clk.

N. 2. Manton, 1898, Hibaldstow, 1898, Broughton, 1900, E. A. W. and Max Peacock. 3. Cadney, 1898, E. A. W. and Max Peacock. 4. Irby, 1899, Clee, Grimsby, 1900, A. Smith. Waltham, 1900, C. B. Parker. Great Cotes, 1898, J. Cordeaux and E. A. W. Peacock. 5. Scotton Common, 1898, E. A. W. and Max Peacock. 7. Market Rasen, 1898, W. Lewington. South Kelsey, 1898, E. A. W. Peacock and H. C. Brewster. 8. Louth, 1886, H. W. Kew. 9. North Somercotes, 1899, E. A. W. Peacock.

S. 13. Court Leys, 1900, Miss Stow. 15. Grantham, 1898, L.N.U. Meeting.

Philodromus fallax Sund. (*P. deletus* Cb.).

N. 11. Ingoldmells, 1899, E. A. W. Peacock. 12. Freiston, 1899, H. Preston.

Thanatus striatus Koch (*T. hirsutus* Cambr.).

N. 3. Cadney, 1898, E. A. W. and Max Peacock.

Tibellus oblongus Walck.

(*Thanatus oblongus* Walck.). (*Philodromus oblongus* Bl.).

N. 3. Cadney, 1898, E. A. W. and Max Peacock. 4. Grimsby, August 1900, Ravendale, July 1899, A. Smith. 5. Cleatham, 1898, E. A. W. Peacock. 7. Newball Wood, 1899, E. A. W. Peacock. 9. Mablethorpe, 1886, H. W. Kew. North Somercotes, 1899, E. A. W. Peacock.

Family *SPARASSIDÆ.*

Micrommata virescens Clk. (*Sparassus smaragdulus* Walck.). (*S. ornatus* Bl.). (*S. roseus* Clk.).

N. 2. Broughton, 1900, E. A. W. Peacock. 3. Cadney, 1900, E. A. W. Peacock.

Family *PISAURIDÆ.*

Pisaura mirabilis Clk.

(*Dolomedes mirabilis* Bl.). (*Ocyale mirabilis* Cb.)

N. 3. Cadney, 1898, E. A. W. and Max Peacock. 4. Ravendale, Brocklesby, Keelby, Irby, Habrough, 1899-1900, Smith and Parker. 7. Linwood, 1898, E. A. W. and Max Peacock. Market Rasen, 1898, W. Lewington. Wragby, 1887, H. W. Kew. 8. Louth, Burwell Wood, 1886, H. W. Kew. 11. Well Vale, 1886, H. W. Kew.

S. 13. Hartsholme, 1898, L.N.U. Meeting.

Family *LYCOSIDÆ.*

Pirata piscatoria Clk. (*Lycosa degreyii* Camb.).

N. 3. Cadney, 1898, E. A. W. Peacock.

Pirata hygrophilus Thor. (*Lycosa piscatoria* Bl.).

N. 4. Great Cotes, 1898, E. A. W. Peacock and J. Cordeaux.

S. 13. Hartsholme, 1898, W. Lewington.

Pirata piraticus Clk. (*Lycosa piratica* Bl.).

N. 1. Isle of Axholme, 1898, E. A. W. Peacock. 4. Great Cotes, 1898, E. A. W. Peacock and J. Cordeaux. Irby, September 1900, C. B. Parker. 9. Mablethorpe, 1886, H. W. Kew.

Pirata latitans Bl. (*Lycosa latitans* Bl.).

N. 7. Linwood, 1898, E. A. W. and Max Peacock.

Trochosa ruricola DeGeer (*Lycosa campestris* Bl.).

N. 2. Broughton, 1900, E. A. W. Peacock. 3. Cadney, 1900, E. A. W. Peacock. 8. Louth, Cawthorpe, 1886, H. W. Kew.

Trochosa terricola Thor. (*Lycosa agretyca* Bl.).

N. 2. Broughton, 1900, E. A. W. Peacock. 3. Cadney, 1893, E. A. W. Peacock. 8. Louth, 1886, H. W. Kew. 9. Mablethorpe, 1886, H. W. Kew. 11. Ingoldmells, 1899, E. A. W. Peacock.

Trochosa picta Hahn. (*Lycosa picta* Bl.).

N. 4. Grimsby, August 1900, A. Smith. 5. Cleatham, 1898, E. A. W. Peacock. Scotton Common, 1898, E. A. W.

and Max Peacock. 9. North Somercotes, 1899, E. A. W. Peacock. Mablethorpe, 1886, H. W. Kew. 11. Ingoldmells, 1889, E. A. W. Peacock.

Tarentula pulverulenta Clk. (*Lycosa rapax* Bl.).

N. 9. Mablethorpe, 1886, H. W. Kew.

S. 13. Court Leys, 1900, Miss Stow.

Tarentula miniata Koch.

(*Lycosa nivalis* Koch. Camb.). (*L miniata* Koch. Camb.).

N. 9. Mablethorpe, 1886, H. W. Kew. Rare and local.

Lycosa amentata Clk. (*L. saccata* Bl.).

N. 2. Hibaldstow, 1898, E. A. W. and Max Peacock. 3. Cadney, 1898, E. A. W. and Max Peacock. 4. Great Cotes, 1898, E. A. W. Peacock and J. Cordeaux. Healing, Bradley, Ravendale, Irby, Grimsby, 1898, A. Smith. 8. Louth, 1886, H. W. Kew.

S. 13. Court Leys, 1900, Miss Stow. 15. Grantham, 1898, L.N.U. Meeting.

Lycosa annulata Thor.

N. 5. Cleatham, 1898, E. A. W. Peacock. 7. Newball Wood, 1899, E. A. W. Peacock.

Lycosa nigriceps Thor. (*L. congener* Cambr.).

N. 2. Manton, 1898, E. A. W. and Max Peacock. 5. Scotton Common, 1898, E. A. W. and Max Peacock. 8. Louth, 1886, H. W. Kew.

Lycosa proxima Koch.

N. 8. Louth, 1886, H. W. Kew.

Lycosa pullata Clk. (*Lycosa obscura* Bl.).

N. 1. Isle of Axholme, 1898, E. A. W. Peacock. 2. Broughton, 1900, E. A. W. Peacock. 3. Cadney, 1898, E. A. W. and Max Peacock. Limber, 1898, A. Smith. 4. Great Cotes, 1898, E. A. W. Peacock and J. Cordeaux. 5, Scotton Common, Kirton, 1898, E. A. W. and Max Peacock. 7. Linwood, 1898, E. A. W. and Max Peacock.

S. 13. Court Leys, 1900, Miss Stow.

Lycosa lugubris Walck.

N. 4. Clee, September 1900, A. Smith. 8. Haugham Wood, 1886, H. W. Kew.

Lycosa palustris Linn. (*L. exigua* Bl.).

N. 4. Cleethorpes, April 1887, H. W. Kew. Irby, 1899, Grimsby, 1900, A. Smith.

S. 15. Grantham, 1898, R. Worsdale.

Lycosa monticola Clk. (*L. exigua* Bl.).

N. 3. Cadney, 1898, E. A. W. Peacock. 4. Grimsby, 1900, A. Smith.

Family *SALTICIDÆ.*

Epiblemum scenicum Clk. (*Salticus scenicus* Latr.).

N. 4. Irby, September 1900, C. B. Parker. Grimsby, 1898, A. Smith. 7. Market Rasen, 1898, W. Lewington. South Kelsey, 1898, E. A. W. Peacock and H. C. Brewster. 8. Louth, 1886, H. W. Kew. 9. Mablethorpe, 1886, H. W. Kew.

S. 15. Grantham, 1898, R. Worsdale.

Epiblemum cingulatum Panz. (*Salticus scenicus* Latr. Bl.).

N. 8. Louth, 1886, H. W. Kew. 9. Saltfleetby, 1886, H. W. Kew.

Heliophanus flavipes Koch.

N. 9. North Somercotes, 1899, E. A. W. Peacock. Local and rare.

Marpessa muscosa Clk.

N. 4. Grimsby, August 1900, A. Smith.

Attus pubescens Fabr. (*Salticus sparsus* Bl.).

N. 8. Louth, 1886, H. W. Kew.

Hasarius falcatus Bl. (*Salticus coronatus* Walck.).

N. 7. Market Rasen, 1898, W. Lewington.

Hasarius adansonii Sav.

N. 5. Gainsborough, 1898, E. A. W. Peacock. Introduced; now found in hothouses in various parts of England.

Since writing the above I have had the following new records come to hand:—

Clubiona corticalis Walck.

N. 4. Irby, 16th March 1901, C. B. Parker.

Tegenaria atrica C.L.Koch.

N. 4. Grimsby, May 1901, A. Smith.

Theridion formosum Clk. (*T. sisyphium* Walck.).

N. 4. Irby, May 1901, C. B. Parker.

Leptyphantes leprosus Ohl. (*Linyphia confusa* Cbr.).

N. 4. Waltham, June 1901, H. Markham.

NOTES on LEPIDOPTERA.

***Argynnis adippe* and *Dryas paphia* near Doncaster.**—Both these insects have re-appeared at Edlington this year after an apparent absence of about 25 years.—H. H. CORBETT, Doncaster, 10th August 1901.

***Acherontia atropos* at Doncaster.**—Larvæ of this species have been very common here during July. Many were found in gardens quite in the town feeding on *Lycium barbarum*.—H. H. CORBETT, Doncaster, 10th August 1901.

***Actebia præcox* near Frodingham, Lincs.**—While looking for neolithic flints between Frodingham and Appleby on 28th July I was surprised to find the above-named moth. I have always looked upon it as a purely maritime species, but the conditions of soil and vegetation in the district where it was seen are very similar to those of seaside sandhills.—H. H. CORBETT, Doncaster, 10th August 1901.

***Sphinx convolvuli* in Leeds.**—My gardener, Mr. F. Bywell, brought me this afternoon a fine example of this moth alive, which he had just taken on palings in Brudenell Road, Hyde Park, Leeds. It is now in Mr. John Waddington's collection.—WM. DENISON ROEBUCK, Leeds, 17th August 1901.

***Sphinx convolvuli* near Boston, North Lincolnshire.**—I received lately a fine specimen of this rare moth, captured by Mrs. Disbrowe, of Benington Rectory, Boston, Div. 12, on 24th July. Through the generosity of this lady the example is now in my collection.—ALFRED THORNLEY, South Leverton Vicarage, Lincoln, 16th August 1901.

***Sphinx convolvuli* near Boston, Lincs.**—Late in July one hot evening a fine specimen of the Convolvulus Hawk Moth flew into the Rectory. It was found little injured the next morning, and lived long enough to show its magnificent eyes. Perhaps it may not be a scarce insect this summer. It is the first known to have appeared in this neighbourhood.—Mrs. DISBROWE, Benington Rectory, Boston, Lincolnshire, 12th August 1901.

NOTE on SPIDERS.

Northumbrian Spiders in 1900.—Although the wet and cold weather which prevailed last August rendered collecting anything but pleasant or profitable, a short time spent in beating the dripping vegetation at Staward, over a limited space of ground, produced some spiders which, owing to their rarity in Northumberland, are worthy of note for that county. On the highroad crossed on the way to the Peel a mature female *Epeira cucurbitina* Clk.—this making its third known habitat in Northumberland (see Nat., December 1897)—was beaten from broom. In the valley immature *Tibellus oblongus* Walck., before recorded for Cold Martin Moss, was obtained in the same way from grass overhanging the cartroad. I next found immature *Zora spinimana* Sund., a spider new to the county. Adult examples of both sexes of *Neriene rubella* Bl., on record for Bardon Mill, and of *Hasarius falcatus* Cb., on record for Wooler; and immature specimens of *Dicyphus bituberculatus* Wid., on record for Wooler and Cold Martin Moss, were also secured. *Ocyale mirabilis* Clk., male and female, in this its only known Northumbrian station (see Nat., October 1896), were plentiful, roaming over the grass, and immature specimens were beaten from herbage. This list may fitly be closed by two species of great interest. One is determined by the Rev. O. Pickard-Cambridge, to whom it was submitted for identification, to be *Clubiona trivialis* L.Koch (♀), a rare English spider, but taken before in the county by Mr. Hardy at Wooler (a mature male), twenty-six years ago. The other is a Lycosid, intermediate between *Lycosa herbigrada* Bl. and *L. palustris* L., known to some as a variety of *L. herbigrada*, and to others as a variety of *L. palustris*. —WILLIAM FALCONER, Bank Field, Slaithwaite, 11th July 1901.

BRITISH MUSEUM NATURAL HISTORY
7 SEP. 1901

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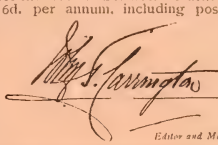

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BOOKS RECEIVED.

Bücher-Verzeichniss von R. Friedländer & Sohn.—No. 437, Entomologie, II., Lepidoptera, received 14th September 1901. [Publishers.
Smithsonian Inst.—Rep. of U.S. Nat. Museum to 30th June 1897. [The Institution.
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W. H. Wheeler.—The Source of the Warp in the Humber; 8vo. rep., 1901. [Author.
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L. O. Howard.—The Economic Status of Insects as a Class; 8vo. reprint, 1900. [Smithsonian Institution.
Julius Webster.—The Relation of Plant Physiology to the other Sciences: 8vo. reprint, 1900. [Id.
James Geikie.—The Tundras and Steppes of Prehistoric Europe; 8vo. reprint, 1900. [Id.
Paul Falkenburg.—The Garden and its Development: 8vo. reprint, 1901. [Sm. Inst.
J. Burdon-Sanderson.—Relation of Motion in Animals, etc.: 8vo. reprint, 1901. [Id.
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J. J. Wilkinson.—The Pharynx of the Eristalis Larva: 8vo. reprint, 1901. [Author.
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H. Kolbe.—Gartenfeinde und Gartenfreunde, 8vo., cloth, 1901. [K. Siegismund.
Glasgow Meeting of Brit. Assoc.—Various Handbooks and Excursion Guides. [Local Committee.

Lepidium.—I earnestly desire notes of the occurrence of *Lepidium Draba* and *sativum*, and hope to have correspondence from any locality where it occurs. —A. SMITH, 5, Cavendish Street, Grimsby.

Fossil Mollusca from Eocene and Oligocene, Paris Basin. Suites of these interesting Fossils, boxed, named, and localised, 40 varieties, by parcels post, on receipt of postal order for 6s. 6d.—Address R. CHARLES, Naturalist, Highcliffe-on-Sea, Christchurch, Hants.

Flora of West Lancashire: Silverdale Area.—I have tried to buy and I have tried to borrow the undermentioned issues without success. Will someone (if unable or unwilling to lend) extract for me the West Lancashire items relating to Silverdale? A list has been on the stocks for some years and only waiting for this information to complete the bibliography. Watson Bot. Exch. Club, Nos. 1, 2, 4, 5, 7, 8, 10, 12 to date; Rep. Bot. Exch. Club, 1867 and earlier, 1869, 1877-8-9, 1881, 1890, 1896 to date.—S. L. PETTY, Ulverston.

LARVÆ OF *SPHINX CONVOLVULI* IN YORKSHIRE.

ARTHUR WHITAKER,

Saville House, Worsborough Bridge, Barnsley.

On the 30th August a full-grown caterpillar of the Convolvulus Hawkmoth (*Sphinx convolvuli*) was found crawling across a road near to Monkton Main Colliery, at Roystone, near Barnsley. Through the kindness of several friends it came into my hands on 1st September, when I took the following description of it:—Colour uniform bright green, no lighter on under parts. Face green with four fine black stripes, the two centre ones forming a V-shaped mark, with the apex at the mouth. Oblique stripes seven in number, slightly more yellow than ground colour, but only just visible. Spiracles enclosed in black blotch, another black mark bordering the top half of the oblique stripe and continued past it well on to back, there turning down towards tail and running nearly to the angle of the next similar mark; this black mark was uniformly about one-eighth of an inch broad. Horn long, nearly smooth, much curved, and sharply pointed, in colour bright orange red, tipped with black. Legs black. Claspers green. Length about 3½ inches, and rather stout in proportion.

Thinking it possible that where there was one larva there would be others, I took the opportunity of running over to Monkton on the 2nd September on the chance of obtaining another or two; in this I was not disappointed. After a little trouble I succeeded in finding the place where the first caterpillar had evidently been obtained. The bottom of a rail along the side of a field for some 200 yards was thickly overgrown with the small field Convolvulus (*Convolvulus arvensis*); this was so much eaten that I believe about a dozen of these caterpillars must have fed up there. After a careful search of about two hours' duration I obtained four of them, all about full grown.

A most interesting feature of the 'find' was the great variety of colour exhibited. Of the four I found three were brown, one green; the latter differed from the one first brought to me, and already described, in the following respects:—The spiracles were narrowly outlined in red as well as enclosed in dark blotch. The general ground colour was lighter. The dark marks were merely borders to the yellow oblique stripes (which were much

more pronounced) and were not prolonged past them or carried down the back at all.

The brown variety was of a dirty yellowish white ground colour, clouded with deep brown, the markings being thickest on the back and almost absent below the spiracles nearly to the claspers, which were again brown. The spiracles were enclosed in a darker blotch, and the brown cloudings on the sides were so clustered as to suggest to the eye the usual oblique stripes of the Hawkmoth caterpillars, but only indistinctly. The horn in this brown variety was all black, as also were the legs. The face was yellowish brown, with the same black stripes as the green variety. The largest of the five caterpillars was about 4½ inches in length, almost as large as *Acherontia atropos*.

All these larvæ have now 'gone down' into the soil to pupate, and I am anxiously awaiting the emergence of the perfect insects. From what I can hear this is the first record of the larvæ of *Sphinx convolvuli* having been taken in Yorkshire. I might say that the caterpillars have been shown to Mr. W. E. Brady, of Barnsley, a well-known entomologist, who expresses his opinion that the larvæ certainly are those of *S. convolvuli*, and Mr. John Harrison, F.E.S., of Barnsley, is also of the same opinion.

1901 Sept. 18.

NOTES on MAMMALS and BIRDS.

Gamekeeper's Hoard at Kirk Smeaton.—At Kirk Smeaton on Saturday last, the 15th June, in Brock o' Dale, a gamekeeper's hoard was suspended from the branches of a tree, and contained the following:—Sixteen Magpies (*Pica pica*), 3 Crows (*Corvus corone*), a Sparrow Hawk (*Accipiter nisus*), 3 Weasels (*Putorius nivalis*), and 8 Stoats (*P. ermineus*). Nearly all of these appeared to have been recently killed, and were hung by the neck on a cord.—T. SHEPPARD, The Museum, Hull, 18th June, 1901.

Hedgehog in Disgrace: Dunsby Wood, Linc. S.—On the 11th of June, while botanising in Dunsby Wood, Div. 16, I found a Hedgehog (*Erinaceus europæus*) sucking Pheasant's eggs; I wondered at first what it was so intent upon, and on moving it aside found it had made sad work with the contents of a Pheasant's nest, having sucked 4 eggs out of 9. The rest would no doubt share the same fate. The nest was in the position usually chosen by Pheasants, and close to the edge of the wood.—S. C. STOW, Court Leys, Brandon, Grantham, 21st June 1901.

Squirrel and Little Birds.—'Did you know that little birds come together and chatter at a Squirrel, as they do at a Cuckoo? Twice during the past week there has been a Squirrel in the sycamore tree near the summer-house. A mob of little birds chattered at it on both occasions, just as if they knew it liked eating eggs, and most probably nestlings.'—Extract from a letter to E. A. W.-Peacock from Miss MABEL PEACOCK, Dunstan House, Kirton-in-Lindsey, 17th June 1901.

NOTES on LEPIDOPTERA.

***Colias hyale* near Louth, Linc. N.**—I took this species on 1st Sept. about three miles west of Louth, on *Centaurea nigra*. It is considerably over twenty years since it was found in the neighbourhood, so far as I can ascertain.—J. LARDER, Louth, Lincs., 5th September 1901.

Death's Head Moth near Wakefield.—I had a very fine larva of *Acherontia atropos* brought me yesterday, found in a garden at Warmfield. H. G. TOWNSEND, Myrtle House, Altofts, Normanton, 7th August 1901.

Hawkmoths in 1901 in Cheviotland Vice-County. This being apparently a 'Hawkmoth year,' I enclose a list of observations in this for north county, which may be of interest:—15th June, Small Elephant Hawkmoth (*Chærocampa elpenor*); 5th September, Privet Hawkmoth (*Sphinx ligustri*); 14th September, larva of the Death's Head Hawkmoth (*Acherontia atropos*), found in a potato patch.—G. ALLHUSEN, Beadnell Tower, Chathill, Northumberland, 16th September 1901.

***Acronycta alni* at Beverley.**—On the 6th June this year I took two *Acronycta alni* at rest here. It is its first occurrence in my collecting experience here of 25 years, except one specimen taken near Hull on the 22nd June 1899. I fancy it is apt to be overlooked by its very early appearance.—N. F. DOBRÉE, Beverley, 22nd August 1901.

***Sphinx convolvuli* at Bakewell, Derbyshire.**—On Thursday, 29th August 1901, I had brought to me a fine female specimen of the Convolvulus Hawk Moth, picked up on the stone pavement of a backyard in Bakewell.

Again, on Thursday, 12th September, another specimen, this time a male, was brought to me, having been found clinging to a linen sheet which had been hung out to dry.

I have never heard of the appearance of this species in this part of North Derbyshire before.—WM. BOULSOVER, Curator Bakewell Naturalists' Club Museum, Ferndale, Bakewell, 15th September 1901.

Re-appearance near Scarborough of the Marbled White and Purple Hairstreak Butterflies.—I am permitted to record the re-appearance this year in the immediate neighbourhood of Scarborough of *Argè galathea* and *Thecla quercûs* after years of presumed extinction.

On a day towards the end of last July, the father of Mr. H. W. Head, of Scarborough, who habitually assists his son in his entomological work, caught a male *Argè galathea* and brought it alive to his son, both the catch and the identification being unquestionable. When caught it was at rest on the grass, and was in such good condition as to show that it had not long emerged. Though subsequent search was made no other specimen was found. The situation, which is quite near to Scarborough, is one not much visited by Mr. Head in his peregrinations, and there is nothing to support the idea of it being in any way introduced.

This species is recorded by Mr. Birchall as being here many years ago (see Porritt's List of Yorkshire Lepidoptera), but it has never occurred in the time of any living local entomologist. Mr. J. H. Rowntree imforms me he has never heard of its occurrence here.

I believe the last Yorkshire specimen was taken in the Green Lane, Sledmere, on 3rd August 1891, on the occasion of the Yorkshire Naturalists' visit to that place, and I fancy that actual specimen is now in the possession of Mr. W. Hewett.

Though *Thecla quercûs* is recorded for Scarborough by Wilkinson, its existence here has been unknown to local entomologists since that gentleman's death. Two were seen by Mr. Charles Head (brother of Mr. H. W. Head), a well-known ornithologist here, in mid August in Forge Valley, flying round the oaks on the east side of the valley. This gentleman is well acquainted with the insect and its habits; and though, having no net with him, a capture was impossible, I think the record may be regarded as established.—REGINALD H. BARKER, Grosvenor Bank, Scarborough, 13th September 1901.

NOTES on LINCOLNSHIRE BIRDS.

Eared Grebe at Horncastle, Linc. N.—A specimen of the Eared Grebe (*Podiceps nigricollis* Brehm) was shot at Horncastle Brick-pits on 2nd July, the shooter being afterwards fined by the magistrates, it being the 'close' season. A violent east gale had been raging for four days, and this had doubtless carried the bird more than 20 miles inland from the east coast.—J. CONWAY WALTER, Langton Rectory, Horncastle, 6th Sept. 1901.

Bird Enteritis in the Brigg District.—English and French Partridges have been dying round here for the last few weeks of Klein's disease or fowl enteritis. Thousands of game birds, young and old, have already perished. My son, Dennis, pointed out to me this morning a Blackbird of this season, which could not fly, in the garden. On observing and handling it I found it had been a well-developed bird, which was affected with the prevailing disease. It was nearing its end rapidly. During the past few years I have examined hundreds of game birds which have died of it, representative specimens of hundreds of thousands which have fallen before the dire bacilli of this disease. Whether Klein's enteritis and Pasteur's fowl cholera, more commonly called the Orpington disease, are one and the same, I have been unable to settle to my own satisfaction. Both kill in from 24 to 48 hours, and sweeping over partridge soil and pheasant preserves will often leave but 5 per cent. of resisting birds behind. Rabbits and even hares die of Pasteur's cholera, but cases are apparently very rare, and only occur when the ground is badly contaminated. This Blackbird is the first case I have either heard of or seen among our smaller birds. The Partridges in this parish have nearly been cleared off by enteritis, and are still dying. In one case I knew 4,800 Pheasants perished out of 5,000 in less than a week. What the soil would be like after such a visitation is better left to the imagination than described. The Windpipe Gape Worm (*Syngamus trachealis* Sieb) has been more or less destructive about Broughton, but I have not met with it here.—E. ADRIAN WOODRUFFE-PEACOCK, Cadney, Brigg, 26th August 1901.

Golden Oriole at Gainsborough.—I am glad to be able to report the occurrence of this beautiful bird (*Oriolus galbula*) in my garden. It was first seen on the 3rd of this month (August) by Mr. Gerard d'Abo, of Arnhem; and as this Oriole is of frequent occurrence in Holland, and is well known to Mr. d'Abo, his record is to be relied on. In further proof, however, the bird was seen again the following day by Miss F. H. Woolward, of Belton, near Grantham, who was staying with us, and is a practised observer of anything connected with nature. It was flying across the garden, and she had the good fortune to hear its song, describing it as 'most beautiful and something she had never heard before.'

In 1899, when staying in Holland, I saw the Golden Oriole on the 15th July at Berg-en-dal. It was taking short flights from tree to tree, and uttering, as I thought at the time, the most beautiful notes I ever heard given forth by bird—notes utterly distinct from any others, and, once heard, never to be forgotten.

Seebohm says of it: 'Its voice is marvellously rich and flute-like'; and 'it is a pity the song is so short; for in quality it is scarcely exceeded by the song of any other bird.' The words he uses to describe the song, 'wheet, li, vee—o,' though, like other verbal attempts of the same kind, they can give little or no idea of it to those who have never heard it, always recall the song to me at once.

Early on the morning of the 18th of August I heard the bird's call-note close to my room; and in the afternoon I heard it sing. The song, however, was not the full, beautiful song which so delighted me in Holland; but a mixture of the call-note and rather harsh sounds, with a few clear, rich, flute-like notes. Later in the day my son saw the bird fly across the lawn.

Naumann gives the ordinary call-note as 'gyake-yake-yake.' This represents with much accuracy the sounds I heard; the specific notes being uttered five times (or thereabouts) in succession, and then repeated.—F. M. BURTON, Highfield, Gainsborough, 27th August 1901.

YORKSHIRE NATURALISTS AT WYKEHAM, NEAR SCARBOROUGH.

JOHN WADDINGTON,
Leeds; Hon. Librarian to the Yorkshire Naturalists' Union.

THE second excursion of the Yorkshire Naturalists' Union for this year took place on Saturday, 22nd June 1901, and the many pleasures in connection with the meeting and the Union's visit to Wykeham and the neighbouring valleys of Yedmandale, Beedale, and Sawdondale will not soon be forgotten.

A party left Scarborough about 10.30 a.m. in a char-a-banc, consisting of the main body of naturalists, the geologists having made a start from Seamer Junction. On reaching Ayton the botanists, under the guidance of Mr. M. B. Slater, F.L.S., and Mr. C. Waterfall, proceeded up Yedmandale, over Hutton Bushel Moor, across the head of Beedale, and down Sawdondale, and had a most enjoyable outing. The 'finds' were many, if not of great importance, particulars of which will be found in the botanical report. The entomologists went forward to Wykeham and from there to Beedale.

There is a charm hanging over this valley. It is a place away from the busy world. With the exception of an occasional woodman it seems deserted. But of bird life there is plenty. Rabbits abounded, and everything that is dear to the heart of the true naturalist is to be found here.

Before entering Beedale we had a pleasing ramble beside the slow, peaceful stream, where at times the Kingfisher may be seen in all its glory, and were soon busy on the look-out for insect life. It was but a beginning of what we were to enjoy. On reaching the gate that shuts off the visitor 'without permission,' we were all delighted with the vision that met our view. This valley, the grandest of the three, contains many charming pictures; but it is the first glimpse of this earthly paradise that pleases most. As we wandered along, everywhere delightful scenes were met with, and here and there on the wing was *Chelonia plantaginis*. The sun was shining on the hillsides, so we entered one of the glades, in order to reach the slopes which tower high on each side, and had the pleasure of seeing his majesty *Cordulegaster annulatus* and later *Libellula depressa*. Here *Argynnis paphia* and *A. aglaia* were in evidence and bent on sport, and the former escaped while being shown to that one-time entomologist, Mr. J. W. Taylor, who, as we all

know, is an eminent man in the world of conchology, and one could not blame the insect for wishing to keep its freedom amidst the pines and bracken instead of being pinned away in some old store box for future reference. I believe Mr. Taylor had a passing regret that he had forsaken 'his old love' when he again saw the fritillaries in all their glory. His son, whom we were endeavouring to initiate into the mysteries of nature, here saw them for the first time, and no doubt felt, as we have all felt on first seeing *A. paphia* flying, that he had at last found the crowning glory of nature. Higher up the valley, after a stiff climb, we saw Beedale from the head—truly a splendid sight. Here, the home of *Thecla rubi,* we saw on the wing *Bombyx quercus*, evidently from the moors above.

On the return journey, while seated waiting for the sun to come from behind a cloud, in order to see again *A. aglaia,* we noticed the botanical party on the hills above, having crossed the head of Beedale to go down Sawdondale. *Abraxas ulmata* were everywhere in evidence.

Time was getting short, so we made for the Downe Arms, where the worthy landlord, Mr. Gray, had provided tea. Afterwards the various sectional meetings were held, and notes compared, under the direction of Mr. Geo. T. Porritt, F.L.S., F.E.S., and thus concluded one of our happy outings, which begins with natural history and ends in good fellowship. Long may it be so.

At the general meeting, at which Mr. Porritt presided, a vote of thanks to the Rt. Hon. Viscount Downe, the Rt. Hon. Earl of Londesborough, and Sir Charles Legard, Bart., for allowing the Union to visit their estates, as well as to the leaders of parties, viz., Messrs. E. R. Cross, D. W. Bevan, W. Gyngell, and J. W. Stather, was passed on the motion of Mr. M. B. Slater, F.L.S., and votes of condolence with the Messrs. J. H. and Allen Rowntree on the family bereavement which had prevented their accompanying the party, and with the relatives of the late Colonel B. B. Haworth-Booth, were also passed.

The sectional reports were then given.

For the Vertebrate Section Mr. Riley Fortune, F.Z.S., reported that it was but poorly represented, the President, Mr. W. Denison Roebuck, F.L.S.; Mr. Oxley Grabham, M.B.O.U., and one of the Secretaries, Mr. Riley Fortune, F.Z.S., being the only members present. A fair number of birds were observed, but nothing calling for special comment.

Following is a detailed list of species noted, an asterisk in front of the name denoting that either eggs or young birds were seen:—

MAMMALS (5).

Rabbit. Mole. Squirrel.
Stoat. Weasel.

REPTILE (1).

Blindworm.

AMPHIBIANS (3).

Frog. Toad. Common Newt.

FISH (1).

Trout.

BIRDS (45).

Kestrel.	Chiff Chaff.	*Greenfinch.
*Spotted Flycatcher.	*Wren.	*Starling.
*Missel Thrush.	Tree Creeper.	Rook.
*Song Thrush.	Great Tit.	Jackdaw.
*Blackbird.	Blue Tit.	Cuckoo.
*Hedge Accentor.	Coal Tit.	*Swallow.
*Robin.	Marsh Tit.	*Martin.
Redstart.	Pied Wagtail.	*Sand Martin.
Whinchat.	Tree Pipit.	Swift.
*Sedge Warbler.	*Meadow Pipit.	*Ring Dove.
*Whitethroat.	Sky-Lark.	Pheasant.
*Lesser Whitethroat.	Yellow Bunting.	*Partridge.
Garden Warbler.	*Chaffinch.	Lapwing.
Wood Warbler.	*Tree Sparrow.	Land Rail.
*Willow Warbler.	*House Sparrow.	Waterhen.

The Conchological Section was officially represented by its President, Mr. J. W. Taylor, F.L.S., and led by Mr. W. Gyngell, by whom this report is furnished. They commenced operations at Cross Gates Quarry, near Seamer Junction, where search was made for *Helix virgata* vars. *nigrescens, leucozona,* and kindred forms, which were found, but only in small numbers owing to the prevailing dry weather. The small party then walked to Forge Valley and there began work again at the lower quarry, where *Helix caperata,* type and var. *fulva,* were found, also *H. nemoralis, H. hispida, H. hortensis, Hyalinia cellaria, Zua lubrica,* and *Bulimus obscurus.* Here also, by pulling up the moss, numerous living specimens of *Cyclostoma elegans* were obtained and quantities of empty shells seen. At the top of the valley on the west side *Helix sericea* and *H. arbustorum* were found to be numerous and *H. fusca* scarce. Odd specimens of *Hyalinia crystallina, H. nitidula,* and *H. radiatula* were obtained amongst rank herbage; also *Arion ater.* Some very fine examples of *Succinea putris* occurred upon leaves of the Common Iris. Returning to Ayton, *Helix aspersa* was noticed about the gardens, and in the river Derwent

Valvata piscinalis was found to be numerous. In Beedale the following species were recorded by Mr. W. Denison Roebuck, F.L.S.: *Arion ater, A. subfuscus, A. hortensis, A. minimus, Limax agrestis, L. arborum,* and *Pupa ringens,* all of which had been found either on the day of the excursion or in his preliminary exploration two or three weeks before.

The Entomological Section was officially represented by its President, Mr. Geo. T. Porritt, F.L.S., F.E.S., and one of its Hon. Secretaries, Mr. John Waddington, who reported that the Lepidoptera taken were :—

Argynnis paphia.
Argynnis aglaia.
Argynnis euphrosyne.
Argynnis selene.
Chelonia plantaginis.
Orgyia pudibunda.
Asthena blomeri
(A good capture).
Melanthia albicillata.
Eupisteria heparata.
Abraxas ulmata.
Acronycta leporina.
Minoa chærophyllata.
Emmelesia affinitata.
Emmelesia alchemillata.
Odontopera bidentata.

The Dragonflies taken were :—

Cordulegaster annulatus
(New to the county).
Libellula depressa
(Not in the list).

The Trichoptera and Neuroptera taken were :—

Ecclisopteryx guttulata.
Rhyacophila dorsalis.
Sialis fuliginosa.
Chloroperla grammatica.
Isopteryx tomentium.
Nemoura cinerea.

Mr. Porritt also took a nest of *Vespa britannica,* which was presented to the Hull Museum; Mr. Bayford also took a specimen of an Ichneumon-fly (*Rhyssa persuasoria* L.) and *Smynthurus fuscus,* a common species of Anoplura, but one not often recorded.

Mr. E. G. Bayford, who spent the week-end at Wykeham, sends the following list of Coleoptera which he obtained :—

Cicindela campestris L.
Carabus catenulatus.
Pterostichus niger Schall.
Calathus cisteloides Panz.
Calathus flavipes Fourc.
Notiophilus biguttatus Fab.
Amara trivialis Gyll.
Bradycellus similis Dej.
Trechus minutus F. var.
obtusus Er.
Harpalus ruficornis F.
Anchomenus marginatus L.
Anchomenus dorsalis Müll.
Helophorus nubilus F.
Helophorus brevicollis Thoms.?
Stenus picipes Steph.
Tachyporus chrysomelinus L.
Adalia bipunctata L.
Adalia obliterata L.
Mysia oblongoguttata L.
Anaitis ocellata.
Halyzia 18-guttata L.
Scymnus suturalis Thunb.
Coccinella 10-punctata L.
Silpha rugosa L.
Pityophagus ferrugineus F.
Rhizophagus parallelocollis Er.
Rhizophagus dispar Gyll.
Omosiphora limbata F.
Brachypterus urticæ F.
Geotrupes sylvaticus Panz.
Melanotus rufipes Herbst.

Dolopius marginatus L.
Campylus linearis L.
Rhagium bifasciatum F.
Crepidodera ferruginea Scop.
Haltica pusilla Duft.
Haltica pusilla
var. montana Foud.
Plectroscelis concinna Marsh.
Phyllotreta undulata Kutz.
Cassida viridis F.
Deporaüs betulæ L.
Hylobius abietis L.
Phyllobius calcaratus L.
Phyllobius argentatus L.
Phyllobius pyri L.
Liophlæus nubilus F.
Hylastes ater Payk.
Hylastes palliatus Gyll.

The Botanical Section was officially represented by Mr. M. B. Slater, Mr. E. R. Cross, and Mr. C. Waterfall, who writes:—At Ayton the first find was *Helleborus viridis,* and on arriving in Yedmandale were found the following, in all about 20 species of plants.

Helianthemum chamæcistus.
Actæa spicata.
Euonymus europæus.
Campanula trachelium.
Campanula latifolia.
Luzula maritima.
Luzula vernalis.
Polystichum aculatum.
Lastræa dilatata.
Lastræa oreopteris.
Pyrola minor.
Fragaria vesca.
Carex dioica.
Paris quadrifolia.
Some with five leaves.
Myosotis arvensis (?).
Viburnum opulus.

Of the Mosses and Hepatics Mr. Wm. Ingham, B.A., writes: The only Sphagnum seen in the route traversed was a tall pale form of *Sphagnum acutifolium* Ehrh. in Beedale. On the walls in Yedmandale occurred the following mosses:—*Barbula rubella* Mitt., in considerable quantity; *Encalypta streptocarpa* Hedw., in large pale-green patches, and all barren as usual, this species being exceedingly rare in fruit; *Bryum capillare* L. and *B. cæspiticium* L., both in good fruit; *Pleuropus sericeus* Dixon, very abundant; *Grimmia apocarpa* Hedw. and *G. pulvinata* Sm., as usual crowded with fruit; *Tortula subulata* Hedw. On the ground and in the woods in Yedmandale were seen:—*Eurhynchium Swartzii* Hobk. and *E. prælongum* B.&S., both barren; *Brachythecium rutabulum* B.&S., in fruit as usual; *Mnium undulatum* L. and *M. punctatum* L.; *Catharinea undulata* W.&M.; *Brachythecium purum* Dixon; *Hypnum Schreberi* Willd.; *Mnium hornum* L., very common as usual; *Funaria hygrometrica* Sibth.; *Weissia viridula* Hedw.; *Plagiothecium sylvaticum* B.&S., in fruit; *Hypnum cupressiforme* L., very frequent on the base of trees and on the walls; *Hylocomium triquetrum* B.&S.; *Hypnum molluscum* Hedw. and *H. cuspidatum* L.; *Thuidium tamariscinum* B.&S.; *Dicranum majus* Turn. and *D. scoparium* Hedw.; *Dicranella heteromalla*

Schimp.; *Ceratodon purpureus* Brid.; *Barbula convoluta* Hedw.; a *Ulota*, barren, on a tree, probably *U. crispa* var. *intermedia* Dixon.

In Beedale the Hepatic *Diplophyllum albicans* L. was common by the side of ditches. Other Hepatics were *Lophocolea heterophylla* Schrad. and *L. bidentata* L.; also *Metzgeria furcata* L., the last found by Mr. Cross on a tree.

In Beedale occurred the *Sphagnum* above mentioned, and the moss *Polytrichum juniperinum* Willd. in fruit. In Sawdondale, *Hypnum commutatum* Hedw., the calcicolous moss, was very common on stones in the stream and on the sides of the stream. Associated with it were *H. palustre* L. in fruit and *H. cuspidatum* L.

On a stone by this stream grew *Plagiothecium depressum* Dixon, the best find of the day. In the higher reaches of Sawdondale, Mr. Bevan found a few mosses, which indicate a good locality for mosses, if only our Scarborough friends will give a little attention to it at different times of the year. These mosses were *Philonotis fontana* Brid., the male plant; *Mnium affine* Bland v. *elatum* B.&S., a very fine growth; and *Hyocomium flagellare* B.&S.

The route traversed did not supply any very unusual moss or hepatic, not because the dales were not charming from an artistic point of view, but because the ground everywhere was so dry, and the water in the dales is so scanty. The rarest and most important mosses found are *Mnium affine* var. *elatum* B.&S. by Mr. Bevan, and *Plagiothecium depressum* Dixon by myself, both of which have been confirmed by Mr. Dixon, of Northampton.

The Geological Section was officially represented by its hard-working Secretary, Mr. Thomas Sheppard, F.G.S., who writes as under:—'The geologists, under the leadership of Mr. J. W. Stather, F.G.S., commenced operations at Seamer Station. Whilst awaiting the arrival of the wagonette containing the Scarborough contingent, the Hull and Leeds members visited the old gravel pit from which the fine boulder of Shap Granite, now exhibited in a garden by the side of Seamer Station, was obtained. This gravel pit, which covers an area of several acres in extent, is of no great depth, and is generally grassed over, but the members were fortunate in finding a recent exposure, about 12 feet deep, near the railway, which was of great interest. The gravel was well rounded, greatly resembling that near the mill at Speeton, and was clearly morainic in character. It had

obviously been brought to its present position from the seaward. There were distinct traces of bedding, and four or five layers of sand, up to six inches in thickness each, occurred in the face of the quarry. These beds were not continuous, but elongated lenticular patches. Of more particular interest, however, were the boulders of which the gravels are composed. Some examples of the Norwegian Rhomb-porphyry and Porphyrite from Dalecarlia; Cheviot Porphyrite (common), Black Flint, Basalt (scarce), Gneiss, Red Granite, Quartz, Quartzite, Mountain Limestone, Magnesian Limestone (from Roker, in Sunderland), Lias, Oolitic Limestone (scarce), and local Estuarine Sandstone (common). By far the greater part of these were found for the first time in this locality,* and the Scandinavian and Cheviot records are distinctly of importance in dealing with questions relating to the direction of the ice movement in Glacial times, etc. Full particulars of these boulders, as well as of others noted on this excursion, have been forwarded for insertion in the next report of the Yorkshire Boulder Committee. These bare records of boulders may at first sight seem insignificant, but it must be remembered that it is upon such 'facts' as these that all theories respecting the condition of things in this country during the Glacial period must be based.

The Crossgates Quarry, on the opposite side of the railway, was next visited. This exhibited sections in the Coralline Oolite, capped by a thin bed of Coral Rag. Some of the beds in this quarry, especially in the lower part, are very massive. Fossils occur here, but owing to the nature of the matrix they are very difficult to extract. The quarrymen had saved several specimens, however, including one or two belemnites, some echinoderms, *Phasianellæ*, and a large though poor example of *Ammonites williamsoni*.

At Stone Knaggs Quarry is a good exposure in the Coral Rag, this pit being well known for its fine examples of *Ostrea gregaria*

* There are previous records of boulders from Seamer printed in the early reports of the Yorkshire Boulder Committee, but with few exceptions these are of an indefinite and unimportant character. In the second report ('Naturalist,' November 1888, p. 343) boulders of Red Granite, Mica Schist, Red Schist, and Shap Granite are recorded. The Shap Granite is definite. In the third report ('Naturalist,' October 1889, p. 296) three boulders of Whinstone, one of 'Hard Sandstone,' and two of 'Soft Sandstone' are noted. The fifth report ('Naturalist,' June 1892, pp. 162-163), contains particulars of many dozens of boulders, several of which are not described at all; others are referred to as 'principally of sandstone,' 'different kinds of sandstone,' etc. Such records can be of little value to anyone.

and other fossils. To a collector of geological specimens the Coral Rag is a veritable paradise—there is such a variety of fossils, their condition is exceptionally perfect, and they are not difficult to obtain. Echinoderms, bivalves, univalves, and corals abound everywhere. The curious 'hummocky' nature of the masses of coral was very noteworthy. It required no great stretch of the imagination, even on the part of a novice, to picture the condition of things that must have existed in the neighbourhood in Jurassic times. The 'Coral Rag'—the last of the British Coral Reefs, with its large rounded masses of coral, grown one upon the other to a great depth; some of them bored through and through with mollusca, the casts of the borings and the contained shells being still intact, and the insterstices between the coral filled with various marine mollusca —resembles in almost every detail the coral reefs so characteristic of the tropical seas of to-day. Favourite sections in the limestone were also seen at Irton Lane and Ayton. These quarries, which were visited and studied by the pioneers of Yorkshire geology, may justly be looked upon as classic ground. *Phasianella striata*, *Pseudodiademma versipora*, *Ostrea nana*, *Cidaris smithii*, *Lima*, etc., are amongst the commonest fossils to be collected. In the Irton Lane section a hard limestone occurs both above and below the Coral Rag. In the Ayton Quarry a boulder of Rhomb-porphyry was noted.

The remainder of the day was spent in examining the drift deposits near Wykeham, briefly described by Mr. P. F. Kendall, F.G.S., on the circular drawn up for the meeting. 'A great mass of gravel extends from East Ayton to Wykeham, forming a nearly flat-topped terrace, which has been regarded as a beach of the lake, which, in Glacial times, occupied the Vale of Pickering. The gravel contains many pebbles of Jurassic rocks, especially Corallian, and Kimeridge Clay, and a small number of rocks foreign to the district, Granites and Cheviot Porphyrites; there are also fragments of marine shells, such as *Tellina balthica*. It is probable that the deposit was laid down along the edge of an ice-lobe which was thrust up the Vale of Pickering as far as Wykeham. The great ridge of gravel which projects out into the low grounds at Wykeham Abbey probably represents a fragment of a terminal moraine.'

At Yedmandale is an interesting example of a dry valley, of Pre-Glacial age, the entrance to which has been dammed by drift. A gravel pit in the side of this dale yielded Moor Grit and local sandstones in abundance, Scandinavian Porphyrite,

Red Granite, Mountain Limestone, Chert, and Lidianstone. At Hutton Bushel a gravel pit was found to contain Rhomb-porphyry, Dalecarlia Porphyrite, Red Granite, Cheviot Porphyrite (common), Whinstone, and Carboniferous Limestone.

Behind the Downe Arms Hotel at Wykeham is a pit in which the sand is exceptionally free from gravel. The sand was current bedded, and in places contained large patches of carbonaceous material. Amongst the small pebbles noticed were Cheviot Porphyrite and Lias (*Gryphæa incurva*). This pit, though principally of sand, evidently belongs to the same series as the gravels already referred to.

NOTES on MAMMALIA.

Badger near Wolsingham, Co. Durham.—On Saturday, 9th March 1901, a beautifully-marked male Badger (*Meles meles*) was captured at Shull, near Wolsingham, by Mr. Thomas Cranston. It was believed to be one of three which had been seen in the neighbourhood for some time, but had hitherto eluded capture.—J. W. Fawcett, Satley, Darlington, 6th Sept. 1901.

Seal on Cartmel Shores.—According to the 'Barrow News,' 31st August 1901, a fine young Seal (*Phoca vitulina* L.) came up with the tide on the evening of 24th August to Grange. It was so much injured in the attempts to catch it that it died. I have a record of another caught on the shore near Flookborough on 1st August 1892. It was ultimately bought by someone at Morecambe, I believe.

Macpherson, 'Fauna of Lakeland,' p. 46, considers the Seal 'decidedly rare on our coast. . . . The last known to have been captured on the Lancashire sands became entangled in the salmon nets near Chapel Island . . . in the autumn of 1889.' Chapel Island is in Furness, almost opposite Conishead Priory.—S. L. Petty, Ulverston, 4th September 1901.

NOTES on REPTILES and AMPHIBIANS.

Viper at Silverdale, West Lancs.—A specimen of *Vipera berus* L., measuring 26½ inches, was killed on Castlebarrow, Silverdale, by Mr. J. Bouskill, about the middle of June last.—S. L. Petty, Ulverston, 1st July 1901.

Adder in the Derwent Valley.—On Friday, 16th June 1899, a large Adder (*Vipera berus*), 24 inches in length, was killed at Darwencote in the Derwent Valley, Co. Durham, by Mr. R. Moffat, of Medomsley.—J. W. Fawcett, Satley, 6th September 1901.

Viper in the County of Durham.—On 12th June 1901 a Viper (*Vipera berus*), measuring 19 inches in length was killed by the road-side near Combe Bridges, in the parish of Muggleswick, Co. Durham, where the species is by no means rare.—J. W. Fawcett, Satley, Darlington, 6th September 1901.

Newts at Silverdale, West Lancs.—I am not aware if the Smooth Newt (*Triton tæniatus* Schneid.) is on record for Silverdale area, but a good many were seen at Wood Well in the large tank, amongst the weed.—S. L. Petty, Ulverston, 1st July 1901.

NOTES on FLOWERING PLANTS.

Grimsby Plants.—Among other plants collected near Grimsby I have found *Silene nutans*, *Phacelia ciliata*, and *Agropyrum prostratum*.—A. SMITH, 5, Cavendish Street, Grimsby, 29th June 1901.

***Ranunculus reptans* in Cumberland.**—This rare plant has been found by Mr. T. S. Johnstone, growing in considerable quantities in two different places, about a mile apart, on the left bank of the River Eden, close to Carlisle. In view of the frequent occurrence of var. *pseudo-reptans* in Cumberland, specimens were sent to Mr. J. G. Baker, F.R.S., for examination, and Mr. Baker was able to confirm Mr. Johnstone's identification that it was the true *Ranunculus reptans*.—W. THOMSON, 11, Lismore Street, Carlisle, 10th August 1901.

***Epilobium montanum* and *Caucalis arvensis* at Court Leys, Grantham.**—Miss S. C. Stow writes from Court Leys, Brandon, Grantham, on the 5th August: 'I saw several plants of *Epilobium montanum* L. here to-day, with three leaves at the nodes. I find that Hooker says the leaves are sometimes in threes. You will be pleased to hear that I have at last found *Caucalis arvensis* Huds., which you said would be sure to turn up again sometime. I came on it this evening growing in a barley field here at Caythorpe.'—E. ADRIAN WOODRUFFE-PEACOCK, Cadney, Brigg, 27th August, 1901.

Hybrid *Potamogeton* in the River Wharfe, Yorkshire.—In 1899 I had a peculiar *Potamogeton* brought me from the Wharfe at Pool Bridge. I planted a specimen of it in a slow-moving shallow stream, and last autumn sent some to Mr. Arthur Bennett. I had previously suspected that it might be a hybrid of *P. perfoliatus* and *P. crispus*, possibly the variety *Jacksoni*, of which I had no description. Mr. Bennett informs me that it is probably that variety; later, during a search in the old locality, a form was brought me apparently intermediate between *P. perfoliatus* and this variety. The plant has never flowered or fruited under cultivation, so that I consider it sterile.—G. B. SAVERY, Silverton, Exeter, 11th September 1901.

***Galium erectum* near Doncaster.**—On Sunday last, 30th June, while walking from Rossington to Doncaster by the field path, I noticed a large *Galium* in a meadow. On examining a branch of it at home I found it to be *G. erectum* Huds. To-day I again visited the station where it grew, and found two well-established clumps of the plant. The field in which they grow is an old meadow near the River Torne. There is no evidence of 'seed grass' having been sown, the herbage consisting chiefly of *Holcus lanatus*, *Trisetum flavescens*, *Arrhenatherum avenaceum*, and the common *Poas*. There is no *Lolium* nor fodder trefoils. Notwithstanding this I have doubts about *G. erectum* being a native here. Under any circumstances it is an interesting addition to our local flora.—H. H. CORBETT, Doncaster, 3rd July 1901.

***Mespilus germanica* on Walney Island.**—Mr. Harper Gaythorpe, of Barrow, sends me a note of this species on Walney Island. Miss E. Hodgson mentioned 'two trees in a high old hedge between Walney Church and North Scale.' (North or Lake Lancashire in 'Journal of Botany,' 1874, or the separately paged reprint, p. x.) Mr. Gaythorpe has found another tree in a field behind the church. He continues: 'By the way the builders are destroying the township of North Scale, there will soon be very little to explore in the near neighbourhood of Walney Vicarage, behind which the Adder's Tongue used to grow.' Yes, it is a pity; but Vickerstown is necessary for the comfort of the men employed by the firm of Vickers, Son & Maxim; and the two trees mentioned by Miss Hodgson are gone and their places now built upon. These trees had a north aspect, Mr. Gaythorpe's find has a south. How the species got to Walney no one knows now, but probably planted. The first located record for Britain is in Merrett's Pinax, 1666. Gerard says 'often-times in hedges among briars and brambles.' 1597. Herbal, p. 1266.—S. L. PETTY, Ulverston, 18th June 1901.

In Memoriam.

WILLIAM WEST, JUNIOR.

SCIENCE has to mourn the loss of one of the ablest of the younger generation of its votaries by the untimely and totally unexpected decease of Mr. William West, junior, the son of our well-known botanist, Mr. William West, F.L.S., of Bradford.

The sad event took place on Saturday, 14th September, at Mozufferpore, in India, of cholera, after he had been but a fortnight at work in his capacity of Biologist to the Behar Indigo Planters' Association.

He and his brother, Mr. G. S. West, B.A., F.L.S., the well-known joint-author with his father of so many valuable papers on Freshwater Algæ, form striking examples of hereditary family ability, cultivated under the guidance and personal tuition of Mr. W. West, senior, concerning whose reputation as a botanist nothing needs to be said for readers of this journal.

William West, junior, who was born at Bradford on the 11th of February 1875, from a very tender age displayed remarkable mental ability. I myself remember well how familiar he was with abstruse works, such as the Nautical Almanack, systematic botanical works, etc., when but a very small boy. His educational career is only to be described as brilliant. At ten years of age, unknown even to his parents, he won a scholarship at the Bradford Technical College, and he afterwards passed brilliantly through the Royal College of Science in London, where he gained the Forbes Medal for botany. At 16 he won a foundation scholarship at St. John's College, Cambridge, where he eventually took the highest honours in the Natural Science Tripos. After taking his B.A. degree he first acted as a science demonstrator at Cambridge, and afterwards—for some years—worked as an extra assistant in the Natural History Museum at South Kensington. He left England on the 8th August of this year to take up the appointment in which he died in harness.

Scientifically he was a botanist, and an accomplished, well-read, and well-trained one, thanks to his father's sound teaching and his own great natural ability. His botanical acumen was so well developed that at the early age of 14 he was able to set the British Museum curators right as to the determination of an obscure *Elatine* displayed in the public galleries.

He was not a prodigal writer, and this journal was the medium in which many of his botanical notes and papers

were printed. The most extensive of these was an article on 'Some Additional West Riding Plant Localities' (Dec. 1895), treating of 34 species. His other notes dealt with *Cochlearia anglica, Carduus acaulis,* and *Cuscuta europæa* at Malham (Aug. 1891), *Agrimonia odorata* at Sedbergh (Oct. 1891), *Andromeda* at Oxenhope (Oct. 1892), *Equisetum pratense* in Teesdale (Sept. 1895), and an early record (Tadcaster 1834) for *Cephalanthera ensifolia* (Ap. 1897). From his pen also we had in June 1898 a review of Prof. Babington's Memorials Journal and Correspondence.

He also had several papers in the 'Journal of Botany.' One treated of some new species of algæ which he described from Plankton collected in the Atlantic; another written jointly with Dr. A. B. Rendle described a new species of *Pithophora*; and another dealt extensively with the plants of Cambridge.

But our friend was by no means wholly or exclusively scientific, and his broad human interests included literary tendencies, which led some of his friends to anticipate for him a promising career in literature as well as in science, and future triumphs in various fields of human knowledge.

His personal characteristics included not only extreme accuracy and wide grasp, and the extraordinarily retentive memory which so greatly facilitated his botanical studies, but a most amiable and lovable disposition which endeared him to all who had the privilege of knowing him, and who consequently feel deeply and grievously the weight of the affliction which the untimely close of his career brings upon us. W. D. R.

NOTE on YORKSHIRE FLOWERING PLANTS.

Effects of the Dry Summer on the Wild Mullein at Thirsk.—As the present summer has been abnormally hot and dry it has produced an unusual effect upon some of our native plants. A specimen of the Wild Mullein (*Verbascum Thapsus*), which grew in my garden without planting, has been an interesting spectacle, so different in appearance from other plants. It stands 7 feet 4 inches high, and has several flower stems. The main central stem is 46 inches, without any leaves, and is as regular as a wand and covered with flowers from top to bottom. The under part of the plant is 42 inches, and has the usual large flannel-like leaves. It is interesting to watch the influence of the sunshine on the plant; towards evening the high stem is inclined to the setting sun, in the morning it regains its usual position. To a naturalist such plants afford an evidence of three several influences. The ascent of the sap to the summit shows vital energy; the bending of the summit of the plant to the sun proclaims the life-giving influence of that luminary; and the falling of the seeds when ripe shows the influence of attraction to the earth's centre, not that the seed has lost its vital energy, because, in fact, the falling seed is as full of life as the parent stem.—FREDC. ADDISON, Sutton Road, Thirsk, 6th Sept. 1901.

BIBLIOGRAPHY:

Papers and Records published with respect to the Natural History and Physical Features of the North of England.

GEOLOGY AND PALÆONTOLOGY, 1898.

THE present instalment has been compiled and edited by

THOMAS SHEPPARD, F.G.S.

Previous instalments of the Bibliography of Geology and Palæontology have appeared as follows:—

For 1884,	in 'Naturalist,'	Dec. 1885, pp. 394-406.
,, 1885,	,,	Nov. 1886, pp. 349-362.
,, 1886,	,,	June 1888, pp. 178-188.
,, 1887,	,,	Feb. 1889, pp. 61-77.
,, 1888,	,,	April-May 1890, pp. 121-138.
,, 1889,	,,	Nov. 1890, pp. 339-350.
,, 1890,	,,	Oct.-Nov. 1891, pp. 313-330.
,, 1891,	,,	July-Aug. 1892, pp. 219-234.
,, 1892,	,,	Sept. 1893, pp. 265-279.
,, 1893,	,,	Sept.-Oct. 1898, pp. 273-296.
,, 1894,	,,	March-April 1899, pp. 81-103.
,, 1895,	,,	Oct.-Nov. 1899, pp. 305-324.
,, 1896,	,,	June 1900, pp. 173-191.
,, 1897,	,,	Jan.-Feb. 1901, pp. 17-36.

I have to thank Mr. W. Denison Roebuck, F.L.S., and Mr. Alfred Harker, M.A., F.G.S., for assistance.

Particulars of papers, etc., omitted from the following list will be gladly received and included at the commencement of the 1899 Bibliography. Every effort will be made, however, to ensure these lists being as complete as possible.

The lists for 1899-1900 will be published as soon as possible, and it would render them more complete if editors of periodicals, secretaries of societies, and especially authors of papers in local journals, etc., would send copies to the editor of this journal at 259, Hyde Park Road, Leeds. Reprints and authors' separate copies should bear the name of the publication, the number of the volume or part, the *original* paging and the *actual* date of publication.'

As regards dating, we would suggest to editors and secretaries that care be taken to give the actual date of publication on the wrapper of all parts of journals and transactions; there

is often difficulty and uncertainty, and we might instance some Transactions as not even stating the *year* of publication of the various parts. Bibliographers would greatly appreciate attention to this point.

The Watsonian vice-counties are adopted throughout these bibliographies as more convenient and uniform in extent than the political counties; those comprised within the North of England are the following:—

53, Lincoln S.; 54, Lincoln N.; 56, Notts.; 57, Derby; 58, Cheshire; 59, Lancashire S.; 60, Lancashire W.; 61, York S.E.; 62, York N.E.; 63, York S.W.; 64, York Mid W.; 65, York N.W.; 66, Durham; 67, Northumberland S.; 68, Cheviotland; 69, Westmorland with Furness and Cartmel; 70, Cumberland; and 71, Isle of Man; with their adjoining seas.

The use of the phrases 'Northern Counties,' 'Lake District,' 'Yorkshire,' etc., implies that the references are vague, or general in their application; the phrase 'All the Northern Counties' implies that every vice-county is represented by definite mention; in all other cases the vice-counties referred to are named.

1897.

M. W. Brown. — Durham, Northumberland S.

An account of the Strata of Northumberland and Durham as proved by borings and sinkings. U.-Z. Issued by the Council of the N. Eng. Inst. M. and M. Eng. Newcastle, 1897, pp. 1-238.

J. Evans. — Yorkshire, etc.

The Ancient Stone Implements, Weapons, and Ornaments of Great Britain. Second edit., pp. xviii. + 747. London, 1897.

Archibald Geikie. — All the Northern Counties.

A New Geological Map of England and Wales, Reduced from the Ordnance and Geological Surveys, and published with Government Authority under the direction of Sir Archibald Geikie, D.C.L., LL.D., F.R.S., with descriptive text. By John Bartholomew & Co., Edinburgh, 1897 **[not seen]**. Reviewed in Geol. Mag., May 1898, pp. 232-233.

Archibald Geikie. — Northern Counties.

The Founders of Geology. London, 1897.

John Guille Millais. — Isle of Man, Northumberland, etc.

British Deer and their Horns. Imp. 4to.; pp. xviii. and 224. London. 1897 **[not seen]**; reviewed at some length in Geol. Mag., March 1898, pp. 133-140].

1898.

Anon. [not signed]. — Cheshire.

The Geology of Alderley Edge. Coll. Guard., Vol. 75, 1898, p. 261.

Anon. [not signed]. — Cumberland.

The Hodbarrow Hæmatite Iron Ore Mines. Coll. Guard., Vol. 75, 1898, p. 991.

ANON. [not signed]. DERBYSHIRE.

Sand and Clay in the Derbyshire Limestones. Coll. Guard., Vol. 75, 1898, p. 32.

ANON. [not signed]. LANC. S.

The Lancashire Coalfield. Coll. Guard., Vol. 75, 1898, pp. 838-839, 898-899, 948-949, 978-980, 1025-1026.

ANON. [not signed]. NOTTINGHAMSHIRE.

The Nottinghamshire Coalfield. Coll. Guard., Vol. 76, 1898, pp. 921, 965.

ANON. [not signed]. DERBYSHIRE.

The Derbyshire Coalfield. Coll. Guard., Vol. 76, 1898, pp. 466, 1014-1015, 1106, 1199.

ANON. [not signed]. YORK MID W. AND S.W.

The Yorkshire Coalfield. Coll. Guard., Vol. 76, 1898, pp. 58-59, 108, 153-154, 198-199, 244, 422-423, 560.

ANON. [not signed]. CHESHIRE.

Monster Boulder [12 ft. 8 in. by 7 ft. 7 in. by 6 ft., unearthed at Little Leigh, between Northwich and Warrington]. Daily Mail, 28th Oct. 1898.

ANON. [Editor]. LINC. N. AND S.

Wasted Wealth [draws attention to the fact that the Artificial Manure Works at Lincoln draw their supplies from Belgium, although the Lias rocks on which Lincoln is built contain beds of phosphatic nodules remarkably free from iron, which are ten per cent. richer than the imported examples]. Natural Science, Aug. 1898, pp. 81-82.

ANON. [Editor]. YORK S.E.

Humber Mud [summarises T. Sheppard's paper on the origin of the Humber mud; see 'Sheppard']. Natural Science, Aug. 1898, pp. 82-83.

ANON. [not signed]. ISLE OF MAN.

Geology at the British Association [Bristol meeting; brief reference to papers dealing with the geology of the Isle of Man, etc.]. Nature, 6th Oct. 1898, pp. 558-559.

ANON. [signed 'K.']. YORK S.W. AND MID W., LANC. S.

Fossil Plants for Students of Botany and Geology. By A. C. Seward [reviewed; fossil plants of the Yorkshire and Lancashire Coalfields briefly referred to]. Natural Science, Oct. 1898, pp. 273-276.

ANON. [signed 'Sigma']. YORK S.E.

On the Trail of the Elephant in Yorkshire [an exaggerated account of the finds made on the Holderness coast; mammoth, etc., remains described]. Sheffield Telegraph, 11th April 1898.

ANON. [not signed]. YORK N.E.

The Glacial Contortions near Scalby [description of the photograph which appears as frontispiece to the volume]. Trans. Hull Geol. Soc., Vol. 4, 1896-1898, p. 5.

ANON. [not signed, query, Editor]. YORK S.E.

Geology in Hull [being a review of Volumes 1, 2, and 3 of the Transactions of the Hull Geological Society]. Nat., Oct. 1898, p. 300.

ANON. [not signed; query, Editor]. N. OF ENGLAND.

[Review of] Summary of Progress of the Geological Survey for 1897. By Sir A. Geikie. . . . 8vo., pp. 176; London, 1898. Geol. Mag., July 1898, pp. 306-318, and Aug., pp. 358-366.

J. Tempest Anderson. York N.E.

[Boulder of Shap Granite at] High Borough, near Grosmont [in 'The Yorkshire Boulder Committee and its Eleventh Year's Work'], Nat., Dec. 1898, p. 354.

J. B. Atkinson. Northern Counties.

Home Office. Mines and Quarries. Advanced Proof of the Tables relating to the Output of Coal and other minerals and the number of persons employed in each county . . . during the year 1897. 1898, pp. 1-3.

J. B. Atkinson. All the Northern Counties.

List of Mines in the United Kingdom of Great Britain and Ireland and the Isle of Man for the year 1897. 1898, pp. 1-349.

J. B. Atkinson. Northern Counties.

Home Office. Mines and Quarries. General Report and Statistics for 1897. Advance proof of the Tables of Fatal Accidents and Deaths in and about the quarries of the United Kingdom. 1898, pp. 1-9.

J. B. Atkinson. Northern Counties.

List of the Plans of the Abandoned Mines. . . . Corrected to the 31st December 1897. 1898, pp. 1-98.

H. Ayton. Northumberland S.

The Re-opening of the Wallsend Colliery. Trans. Fed. Inst. M.E., Vol. 15, 1898, pp. 87-97, 95, and Trans. N. Engl. Inst. M. and M. Eng., Vol. 47, 1898, pp. 219-224.

H. H. Arnold-Bemrose. Derbyshire.

On a Quartz-rock in the Carboniferous Limestone of Derbyshire [describing the structure of a rock consisting essentially of quartz which is found in irregularly-shaped bosses and veins in the Carboniferous Limestone]. Quart. Journ. Geol. Soc., Vol. 54, May 1898, pp. 169-183 (map and sections); Abstract in Geol. Mag., April 1898, pp. 179-180.

[J.] Barnes. See '[W. F.] Holroyd.'

H. C. Beasley. Cheshire.

Notes on examples of Footprints, etc., from the Trias in some provincial museums. Proc. Liverp. Geol. Soc., Vol. 7, 1898, pp. 233-237.

H. C. Beasley. Cheshire.

A Section of the Trias recently exposed on Prenton Hill. Proc. Liverp. Geol. Soc., Vol. 7, 1898, pp. 233-237.

George Best. York N.W., Durham.

'Walks | Around | Darlington | and Neighbourhood | including Weardale, Teesdale, Swaledale, and Wensleydale,' etc. 12 pp., no date (? 1898).

J. F. Blake. York N.E. and S.E.

On Aggregate Deposits, and their Relations to Zones [describing a series of deposits, met with in different formations, which contain an assemblage of fossils from different zones; such deposits having been brought together by strong currents; considers the 'Coprolite-bed' and the 'compound nodular bed' in the Speeton series are examples of these 'aggregate deposits']. Geol. Mag., Nov. 1898, pp. 481-488.

Herbert Bolton. Lanc. S.

The Nomenclature of the Seams of the Lancashire Lower Coal Measures [the names given in different collieries to the various coal seams are compared, summarised, and correlated; details of numerous sections given; discussion printed]. Trans. Manch. Geol. Soc., Vol. 25, Part 16, 1898, pp. 428-472.

H. Bolton. Lanc. S.

The Nomenclature of the Lancashire Coalfields. Coll. Guard., Vol. 75, 1898, pp. 215-216.

H. Bolton. Lanc. S.

The Lancashire Coalfield of England. Trans. N. Y. Acad. Sci., Vol. 16, 1898, pp. 224-251.

G. W. Bulman. Cheshire.

Origin of Arctic Plants in Britain [considers that too much has been made of the 'glaciation' theory in regard to the origin of certain Arctic plants found in England, and that they may have reached the summits of the mountains by other means, possibly carriage by birds]. Sci. Goss., June 1898, pp. 2-5.

Thomas Bunker. York S.W.

The Natural History of Goole Moor and the Immediate Vicinity [geology briefly referred to]. Trans. Hull Scientific and F. N. Club, Vol. 1, No. 1, 1898, pp. 1-9.

B. A. Burrell. York Mid W.

The Composition of the Spar occurring in Mother Shipton's Cave, Knaresborough [mainly Calcium Carbonate, with about 3¾ per cent. of Calcium Sulphate, and nearly ¼ per cent. of Strontium Sulphate]. Proc. Yorks. Geol. and Polyt. Soc., 1898, pp. 284-285.

F. M. Burton. Linc. N.

Boulders at Brigg [an account of some boulders obtained from the 'chalky boulder clay' exposed whilst laying water-pipes at Brigg; including a report upon two of the specimens by Thos. Sheppard]. Nat., Sep. 1898, pp. 257-258.

F. M. Burton. Linc. N.

Lincolnshire Coast Boulders [gives details of some 20 varieties of boulders collected at Sutton-on-Sea, which have been examined and reported upon by Messrs. the Rev. W. Tuckwell and Thomas Sheppard; and suggests that the boulders have in all probability been derived from the Boulder clay of the neighbourhood]. Nat., May 1898, pp. 133-138.

F. M. Burton. Linc. N.

[Geological Notes on the Excursion of the] Lincolnshire Naturalists in the Isle of Axholme [describing the Triassic Marls and recent deposits examined]. Nat., Nov. 1898, pp. 337-338.

F. M. Burton. Linc. N.

"Erratic Boulders in Lincolnshire" [reply to Mr. Cooke's remarks which appeared in a previous number]. Nat., Feb. 1898, p. 52.

George Caldwell. Lanc. S.

Notes on Hematite found in the Maypole Sinking Pits [specimen exhibited from a boring put down by the Moss Hall Colliery, and briefly described]. Trans. Manch. Geol. Soc., Vol. 25, Part 14, 1898, pp. 393-394.

J. T. C[arrington]. Northern Counties.

Geological Photographs [review of the work of the Geological Photographs Committee of the British Association; brief reference made to photographs from Yorkshire, Lincolnshire, etc.]. Science Gossip, March 1898, p. 283.

W. L. C[arter]. Yorkshire, Lake District.

In Memoriam. Thomas Tate, F.G.S. [reference made to his work in Yorkshire, the Lake District, etc.]. Proc. Yorks. Geol. and Polyt. Soc., 1898, pp. 350-352, with photograph.

W. Lower Carter. Yorkshire.

Secretary's Report, 1897 [to the Yorkshire Geological and Polytechnic Society; describes the excursions of the Society during 1897]. Proc. Yorks. Geol. and Polyt. Soc., 1898, pp. 358-364.

Grenville A. J. Cole. Derbyshire.

On Meshwork-structures observable in Microscopic Sections of Rocks [citing an example in photographs which accompany H. H. Arnold-Bemrose's paper 'On a Quartz-Rock in the Carboniferous Limestone of Derbyshire']. Geol. Mag., June 1898, pp. 252-254.

E. Maule Cole. York S.E.

Notes on the Danes' Graves near Driffield [describes the recent excavations and suggests that the mounds were erected by the Parisi]. Proc. Yorks. Geol. and Polyt. Soc., 1898, pp. 299-301, and plate.

C. T. T. Comber. York N.E.

Fossil Limpet at Pickering [note recording two specimens of *Patella rugosa* var., Hudleston, from the Calcareous grit]. Naturalist, July 1898, p. 200.

John H. Cooke. Linc. N.

Erratic Boulders in Lincolnshire [note replying to F. M. Burton's warning anent the recording of Lincolnshire erratics]. Naturalist, Jan. 1898, p. 20.

John H. Cooke. Linc. N.

Lincolnshire Boulders. Third Paper [agrees with F. M. Burton's remarks in a previous number as to the care that should be exercised in recording boulders, and points out that the boulders in his previously-published lists 'no doubt were deposited by ice action in the *immediate* neighbourhood'; gives further lists of boulders at Old Clee, Humberstone, etc.]. Naturalist, Jan. 1898, pp. 17-20.

John H. Cooke. Linc. N.

Lincolnshire Boulders. Fourth Paper [gives lists of Boulders at Louth, Hallington Beck, etc.; illustrated by sketch of section at Eastgate, Louth, showing position of boulder of Dolerite]. Naturalist, March 1898, pp. 85-87.

John H. Cooke. Linc. N. and S.

Neolithic Life in Lincolnshire. First Paper [enumerates the various finds of implements, etc., of Neolithic workmanship made in the county]. Naturalist, March 1898, pp. 77-79.

John H. Cooke. Linc. N. and S.

Neolithic Life in Lincolnshire. Second Paper [a further reference to the stone implements, etc., found in the county; a description is also given of the 'dug-out' canoe found at Brigg in 1886]. Naturalist, May 1898, pp. 145-148.

John H. Cooke. Linc. N. and S.

Neolithic Life in Lincolnshire. Third Paper [a further contribution to this subject]. Naturalist, July 1898, pp. 221-224.

E. Maule Cole. York S.E.

Inroads of the Sea near Spurn [noting loss of over four yards per annum since 1847 at Kilnsea and of over five yards per annum at Easington between 1892 and 1894]. East. Morn. News, 17th May 1898.

H. H. Corbett. York S.W.

[Boulders at] Cusworth and Sprotborough, Balby, and Doncaster [in 'The Yorkshire Boulder Committee and its Eleventh Year's Work']. Naturalist, Dec. 1898, pp. 354-355.

JOHN CORDEAUX. LINC. N.

Lincolnshire Boulders [agrees with Mr. Burton as to the care that should be exercised in recording 'farmyard boulders,' etc.]. Naturalist, Feb. 1898, p. 52.

G. C. CRICK. ? NORTHERN COUNTIES.

List of the Types and Figured Specimens of Fossil Cephalopoda in the British Museum (Natural History). 8vo., p. 103. London, 1898 **[not seen].** Reviewed in Geol. Mag., Nov. 1898, p. 519.

W. H. CROFTS. YORK S.E.

Notes on the Post-Glacial Deposits of Hull and District [describes the peat and later beds resting on the Boulder clay, and details of a recent section near Hull are given; suggests that the ancient chalk cliff of Holderness lies on the east of the Hull, and not on the west as usually supposed]. Trans. Hull Geol. Soc., Vol. 4, 1896-8, p. 36.

BENJ. CROW. LINC. N.

Large Glacial Boulder at Swaby, Lincolnshire [records a boulder of Hornblende Schist, probably Norwegian, found at Swaby]. Naturalist, July 1898, p. 200.

S. W. CUTTRISS. YORK MID W.

Notes on the Caves of Yorkshire [describes the caves in the Carboniferous rocks of Western Yorkshire, including Goyden Pot, Victoria Cave, Attermire Cave, etc.]. Proc. Yorks. Geol. and Polyt. Soc., 1898, pp. 311-324 and plan of Attermire Cave.

PAUL DAVIS. YORK S.E.

The Configuration of Holderness [abstract of a paper read to the Hull Geol. Soc.]. Trans. Hull Geol. Soc., Vol. 4, 1896-8, p. 23.

[W.] BOYD DAWKINS. NORTHERN COUNTIES.

"On the Relation of Geology to Engineering" [being the 'James Forrest' lecture delivered before the Institution of Civil Engineers on 17th March 1898; contains much information of interest to geologists in the northern counties, under the sub-titles of Robert Stephenson on the Movement of Water in Sand; The Movement of Water in Sandstones; Robert Stephenson on Chalk-Water; The Storage Capacity of Chalk; The Water in the Capillaries; The Quantity of Available Water in the Chalk; The Cone of Depression caused by Pumping; The Effect of Pumping on the General Level of Water in the Chalk; and 'The Relation of Superficial Accumulations to the Solid Rocks'; gives drawing (fig. 3, p. 264) showing Cone of Depression Caused by the Mill-Dam Pumps, Cottenham [Cottingham], Hull Corporation Waterworks]. Proc. Inst. Civil Engineers, Vol. 134, 1898, pp. 254-277.

W. B. DAWKINS.

Geology and Engineering. Coll. Guard., Vol. 75, 1898, p. 525.

ORVILLE A. DERBY. LAKE DISTRICT.

Monazite and Xenotine in European Rocks [not found in Shap granite, which, however, yielded zircon, apatite, and sphene (abundant and fine) and pyrites (rich in faces)]. Mineralog. Mag., Vol. 11, 1898, pp. 304-310.

JOSEPH DICKENSON. LANC. S., CHESHIRE.

Subsidence caused by Colliery Workings [instances in Lancashire and other counties cited, and their causes discussed]. Trans. Manch. Geol. Soc., Vol. 25, Part 21, 1898, pp. 583-615. Discussion continued in Vol. 26, Part 2, 1899, pp. 50-81.

[MISS] J. DONALD. CUMBD., YORK N.W. AND MID W., DERBYSHIRE.

Observations on the Genus *Aclisina* DeKoninck, with Descriptions of British Species and of some other Carboniferous Gasteropoda [speci-

mens from Penton, Wensleydale, Settle, Park Hill, etc., figured and described]. Quart. Journ. Geol. Soc., Vol. 54, Feb. 1898, pp. 45-72, plates, 3, 4, and 5.

CECIL DUNCOMBE. YORK N.E.

Evidence of Lake Dwellings on the banks of the Costa, near Pickering, North Riding of Yorkshire [describing a series of piles and adjacent refuse heaps on the banks of the stream; list of animal remains, bone implements and rude pottery found, etc., given]. Journ. Anthrop. Institute, Aug. and Nov. 1898, pp. 150-154 (plate).

H. ST. J. DURNFORD. YORK S.W.

Notes on the change in the Character of the Barnsley Coal-seam between Rotherham and Pontefract. Trans. Fed. Inst. M.E., Vol. 14, 1898, pp. 589-594 (map), and Proc. Mid. Inst. M.E., 1898, pp. 131-136 (map).

A. R. DWERRYHOUSE. LANC. S.

The Irish Sea Glacier [brief abstract of a paper read to the Hull Geol. Soc.; the deep pre-glacial channels cut into the solid rock near Liverpool referred to]. Trans. Hull. Geol. Soc., Vol. 4, 1896-8, p. 10.

A. R. D[WERRYHOUSE]. WESTMORLAND.

Geological Excursion to Appleby. 'Gryphon' (the Magazine of the Yorkshire College), 1898.

GERTRUDE L. ELLES. CUMBERLAND.

The Occurrence of *Placoparia* in the Skiddaw Slates [at Outerside and Ellergill; the specimens are now in the Woodwardian Museum]. Geol. Mag., March 1898, p. 141.

G. L. ELLES. CUMBERLAND.

The Graptolite-Fauna of the Skiddaw Slates [all known genera and species are noted and corrections and additions made, and a table given comparing the Skiddaw graptolites with those in other parts of the world; also gives a useful summary of previous work]. Quart. Journ. Geol. Soc., Vol. 54, Aug. 1898, pp. 463 (several species figured); abstract in Geol. Mag., June 1898, pp. 256-287.

THOMAS FAIRLEY. YORKSHIRE.

On the Water Supplies of Yorkshire [Tables of the Chemical constituents of various waters are given and their suitability for different purposes discussed]. Journal Federated Institutes of Brewing, Vol. 4, May 1898, pp. 393-404, and map.

J. FARRAH. YORK MID W.

[Boulders of Shap Granite at] Claro Hill [in 'The Yorkshire Boulder Committee and its Eleventh Year's Work']. Naturalist, Dec. 1898, p. 356.

T. E. FORSTER. NORTHUMBERLAND S.

Historical Notes on Wallsend Colliery. Trans. Fed. Inst. M.E., Vol. 15, 1898, pp. 77-86; and Trans. N. Engl. Inst. M. & M. Eng., Vol. 47, 1898, pp. 209-218.

C. LE NEVE FOSTER. NORTHERN COUNTIES.

General Report (Part III.) and Statistics relating to the output and value of the metals raised in the United Kingdom, the amount and value of the metals produced, and the exports and imports of minerals in 1897, publ. 1898.

R. L. GALLOWAY. DURHAM.

Annals of Coal Mining and the Coal Trade. Pages xii. + 533. London, 1898. Reviewed by H. Louis in Nature, 9th Feb. 1899, pp. 337-8.

Naturalist,

C. I. Gardiner and S. H. Reynolds. Westmorland.

The Bala Beds and Associated Igneous Rocks of Lambay Island, Co. Dublin [briefly compares (p. 144) certain structures in the Lambay Island Rocks with those in the Carrock Fell Gabbro]. Quart. Journ. Geol. Soc., Vol. 54, Feb. 1898, pp. 135-148.

E. J. Garwood and J. W. Gregory. York N.W., Cumberland.

Contributions to the Glacial Geology of Spitsbergen [briefly refers (p. 222) to the work of Mr. Goodchild in North-west Yorkshire and Cumberland; this paper is of great value to North of England geologists, inasmuch as it contains particulars of observations made, which are of great assistance in solving the numerous glacial problems existing in their territory]. Quart. Journ. Geol. Soc., Vol. 54, May 1898, pp. 198-227, and plates.

Archibald Geikie. Yorkshire, Lake District, etc.

Types of Scenery and their influence on Literature [reference made to the Northern Counties]. London, 1898 **[not seen]**. See criticism in Natural Science, Aug. 1898, pp. 77-78.

Archibald Geikie. All the Northern Counties.

A New Geological Map of England and Wales [scale of 10 miles to an inch]. Edinburgh, 1898.

A. Geikie. North of England.

Summary of Progress of the Geological Survey for 1897 . . . . . 8vo.; pp. 176. London . . . . 1898 [contains much information of interest to North of England geologists]. Reviewed in Geol. Mag., July 1898, pp. 306-318; Aug., pp. 358-366.

Geological Survey of England and Wales. Isle of Man.

One-inch Geological Map, N.S. Sheets 36, 45, 56, 57, in one (=O.S. Sheet 100), by G. W. Lamplugh.

Fred. J. Gray. Isle of Man.

The Rocks of the Isle of Man [describing the various geological features of excursions to Castletown, Port Erin, Port St. Mary, Foxdale, etc.]. Science Gossip, Jan. 1898, pp. 219-222; Feb. 1898, pp. 259-260.

J. W. Gregory. See 'E. J. Garwood.'

W. Gregson. York N.W.

[Boulders at] Cotherstone and Whashton [in 'The Yorkshire Boulder Committee and its Eleventh Year's Work']. Naturalist, Dec. 1898, p. 354.

William Gunn. York N.W. and Mid W., Cheviotland.

Notes on the Correlation of the Lower Carboniferous Rocks of England and Scotland [with table of 'comparative sections of English and Scottish Lower Carboniferous rocks,' viz., in Scotland, North Northumberland, Wensleydale, and Ingleborough; concludes: 'The newer reading, that the Scottish Limestone Series is the equivalent of the Yoredale Beds, and the Calciferous Sandstone of the Mountain Limestone, is a nearer approximation to the truth, but is still far from being correct, especially as it has been shown that the greater part of the Scottish Carboniferous Limestone Series, including the Upper Limestones and the whole of the Edge Coal Series, lies above the position of the Yoredale Beds of Phillips']. Geol. Mag., 1898 pp. 342-349.

W. S. Haddock. Lanc. S., Cheshire.

The Lancashire and Cheshire Coalfields. Coll. Guard., Vol. 75, 1898. p. 897.

ALFRED HARKER. YORK S.E.

Norwegian Rhomb-porphyries in the Holderness Boulder-Clays [giving petrological descriptions of two varieties (an intrusive rhomb-porphyry, and a plagioclase-rhomb-porphyry) found by T. Sheppard in Holderness]. Proc. Yorks. Geol. and Polyt. Soc., 1898, pp. 279-281.

ALFRED HARKER. YORK S.E.

Petrographical Research among Sedimentary Rocks [putting aside the enormous amount of material for study amongst the boulders of the coast, the careful microscopic examination of the sedimentary rocks of East Yorkshire is urged, and lines of research suggested]. Trans. Hull Geol. Soc., Vol. 4, 1896-8, pp. 17-20.

F. W. HARMER. ISLE OF MAN.

The Pliocene Deposits of the East of England: the Lenham Beds and the Coralline Crag [compares (p. 348) the crags with the beds of fragmentary shells recently discovered by the Liverpool Committee near the southern end of the Isle of Man]. Quart. Journ. Geol. Soc., Vol. 54, Aug. 1898, pp. 308-356.

S. N. HARRISON. ISLE OF MAN.

Some remarkable boulders noticed in 1897. Yn Lioar Manninagh, Vol. 3, 1898, pp. 323-324.

W. JEROME HARRISON. YORKSHIRE, LINCOLNSHIRE, ETC.

The Ancient Glaciers of the Midland Counties of England [refers to the North Sea Ice Sheet and its effect upon the eastern counties]. Proc. Geol. Assn., Aug. 1898, pp. 400-408.

JOHN HAWELL. YORK N.E.

The Yorkshire Naturalists' Union at Staithes [geology referred to on p. 106 and 110-111]. Naturalist, April 1898, pp. 105-111.

W. HEWITT. LANC. S.

Notes on some Sections exposed by Excavations on the Site of the New Technical Schools, Byrom Street, Liverpool. Proc. Liverp. Geol. Soc., Vol. 8, 1898, pp. 268-273.

WILLIAM HEWSON. YORK S.E.

Inroads of the Sea near Spurn [with proposals for protecting the headland]. East. Morn. News, Hull, 17th May 1898.

R. S. HERRIES. YORK N.E.

Asteroidea and Ophiuroidea from the Capricornus and Jamesoni Zones of the Lias of Boulby, Huntcliff, Staithes, and Robin Hood Bay, Yorkshire [exhibited at meeting of the Geologists' Association on 5th November 1897]. Proc. Geol. Assn., 1898, Vol. 15, Part 6, p. 238.

[MISS] E. SPENCER HICK. CHEVIOTLAND.

A Ramble in the Isle of Lindisfarne [briefly refers to the fossil Encrinite stems, etc.]. Naturalist, July 1898, pp. 211-218.

HENRY HICKS. YORK MID W.

The Anniversary Address of the President. On the Evidences of the Antiquity of Man furnished by Ossiferous Caverns in Glaciated Districts in Britain [refers at some length to the Victoria Cave, Settle, etc.]. Quart. Journ. Geol. Soc., Vol. 54, May 1898, pp. lxxviii.-cii.; abstract in Nature, 24th Feb. 1898, pp. 402-403.

CHESHIRE, CHEVIOTLAND, YORK S.W.,
WHEELTON HIND. DERBYSHIRE, ISLE OF MAN.

A Monograph of the British Carboniferous Lamellibranchiata. Part III. [describing and figuring species of *Clenodonta, Schizodus, Protoschizodus,* and *Cardiomorpha* from Congleton Edge, Redesdale, Pennystone, Lowick, Settle, Castleton, Thorp Cloud, Poolvash, etc.], pp. 209-276, plates 16-25, Palæontog. Soc., Vol. 52.

Naturalist,

WHEELTON HIND. YORKSHIRE, DERBYSHIRE, NORTHUMBERLAND.

On Mr. Gunn's Correlation of the Carboniferous Rocks of England and Scotland [considers that Mr. Gunn's paper in a previous issue does not make sufficient appeal to the palæontological evidence, and criticises on these lines; see 'Gunn']. Geol. Mag., Nov. 1898, pp. 506-508.

WHEELTON HIND. NORTHUM., YORKSHIRE, DERBYSHIRE, ETC.

Note on the Life-Zones of the Carboniferous Deposits of Europe [compares the Carboniferous Life-Zones already established in Russia and Belgium with the Zones of the British Carboniferous rocks]. Geol. Mag., Feb. 1898, pp. 61-68.

T. V. HOLMES. DURHAM.

On Deneholes and Bell Pits [criticising an article by Mr. Charles Dawson in a previous issue; refers to the Deneholes in the county of Durham, which are considered to have been 'hiding-places from the Danes and earlier piratical marauders']. Geol. Mag., Oct. 1898, pp. 447-458.

[W. F.] HOLROYD AND [J.] BARNES. ISLE OF MAN, DERBYSHIRE.

Fossils from the Carboniferous Limestone [of the Isle of Man, Derbyshire, etc., exhibited at a meeting of the Manchester Geological Society, and briefly described]. Trans. Manch. Geol. Soc., Vol. 25, Part 14, 1898, pp. 394-396.

W. F. HOLROYD. See 'J. Barnes.'

J. H. HOWARTH [Secretary]. YORK N.E., S.E., S.W.

The Yorkshire Boulder Committee and its Eleventh Year's Work, 1896-97 [includes records of Boulders at Doncaster, Saltburn, Holderness, and South (? North) Ferriby, etc.]. Nat., Dec. 1898, pp. 353-356.

HENRY H. HOWORTH. ISLE OF MAN.

The Surface Geology of the North of Europe, as illustrated by the Asar or Osar of Scandinavia and Finland [the Isle of Man, etc., briefly referred to]. Geol. Mag., May 1898, pp. 195-206, and June 1898, pp. 257-266.

W. H. HUDLESTON. YORKSHIRE.

In Memoriam. John Stanley Tute, B.A. [reference made to his work on Yorkshire Geology]. Proc. Yorks. Geol. and Polyt. Soc., 1898, pp. 353-355, and photograph.

G. PRINGLE HUGHES. CHEVIOTLAND.

Notes on the Red Deer, *Cervus elaphus*, Linn. [in Northumberland; with illustration of the antlers of a large individual found beneath a peat deposit at Cresswell Bog; now preserved in Middleton Hall, Northumberland]. Geol. Mag., March 1898, pp. 119-122; and Hist. Berwicks. Nat. Club, Vol. 16, 1898, pp. 81-85.

W. MAYNARD HUTCHINGS. DURHAM, NORTHUMBERLAND S.

The Contact-Rocks of the Great Whin Sill [giving a general description of the effects of contact-metamorphism observed in the rocks altered by the intrusion of the Great Whin Sill in Durham and Northumberland]. Geol. Mag., Feb. 1898, pp. 69-82, and March 1898, pp. 123-131.

H. STANLEY JEVONS. LAKE DISTRICT.

A Numerical Scale of Texture for Rocks [Carrock Fell Gabbro; Shap granite, Buttermere granophyre, etc., cited as examples of grades of coarseness of texture]. Geol. Mag., June 1898, pp. 255-257.

T. RUPERT JONES AND HENRY WOODWARD. YORK MID W.

A Monograph of the British *Palæozoic Phyllopoda*. Part III. *Dithyrocaris*, pp. 125-176, pl. 18-25 [including *D. insignis* sp. nov. from the Millstone Grit of Eccup, near Leeds]. Palæontog. Soc., Vol. 52.

T. Rupert Jones [Secretary]. Westmorland.

The Fossil Phyllopoda of the Palæozoic Rocks [including *Pinnocaris lapworthi* from the Upper Silurian of Kendal]. Geol. Mag., Jan. 1898, pp. 41-44.

John W. Judd. Isle of Man.

The Earliest Geological Maps of Scotland and Ireland [reference is made to Macculloch's 'Description of the Western Islands of Scotland, including the Isle of Man' (1819), etc.]. Geol. Mag., April 1898, pp. 145-149.

J. W. Judd. Yorkshire, Cumberland, etc., Northumberland, Durham.

The Earliest Engraved Geological Maps of England and Wales [pointing out the defects of William Smith's Map of 1815, etc., in certain parts of the North of England]. Geol. Mag., March 1898, pp. 97-103.

A. J. Jukes-Browne and John Milne. York N.E., S.E.

On the Cretaceous Fossils found at Moreseat, Aberdeenshire [many of the fossils found are identical with those from the Speeton Clay]. Geol. Mag., Jan. 1898, pp. 21-32.

P. Q. Keegan. Cumberland, Westmorland.

The Rocks of Patterdale (Ullswater) [from a petrological examination of the rocks in Patterdale recognises three varieties of igneous rock, viz., Andesitic Lava, a Lava of obscure diagnosis, and Volcanic Ash]. Naturalist, Jan. 1898, pp. 5-10.

P. Q. Keegan. Lake District.

On a Certain Structure in the Lakeland Lavas [describing a network structure visible in thin sections which 'may possibly be of service towards supplying some sort of clue as respects the real origin of certain rocks, more particularly as to whether they are really ashes or lavas, clastic or pyroclastic']. Naturalist, Dec. 1898, pp. 365-367.

P. F. Kendall. York N.E.

[Norwegian Boulders at] Saltburn and Staithes [in 'The Yorkshire Boulder Committee and its Eleventh Year's Work']. Naturalist, Dec. 1898, p. 356.

P. F. Kendall. Yorkshire.

The Evidences of a Scandinavian Ice-Sheet [summary of lecture delivered to the Hull Geological Society; the effect of the Scandinavian glacier on the British ice pointed out]. Trans. Hull Geol. Soc., Vol. 4, 1896-8, p. 20.

P. M. C. Kermode. Isle of Man.

The "Irish Elk," *Cervus giganteus*, in the Isle of Man [the results of the excavations carried out by the British Association Committee, a nearly perfect skeleton and portions of others being obtained]. Geol. Mag., March 1898, pp. 116-119.

P. M. C. Kermode. Isle of Man.

Interim Report of the Committee appointed to search for the Remains of the Irish Elk in the Isle of Man, and to raise funds for the purpose. Yn Lioar Manninagh, Vol. 3, 1898, pp. 327-330.

R. Kidston. York Mid W. and S.W.

On the Fossil Flora of the Yorkshire Coalfield. Trans. Roy. Soc. Edinb., Vol. 39, 1898, pp. 33-62, figures and three plates.

G. W. Lamplugh. York S.E., Linc. N.

Some Open Questions in East Yorkshire Geology [a paper read to the Hull Geological Society; reviews the work already done in the district, and suggests lines for further research; attention is principally directed to (1) the lack of information regarding the post-glacial beds and their bearing on the question of changes in the level of the land

surface since glacial times; (2) the absence of palæolithic implements in the district and the cause thereof; (3) the relative age of the buried cliff at Sewerby and the gravels of Central Holderness; (4) the relation of the estuarine silt at Kirmington to the shelly gravels of Croxton; (5) the want of information regarding the beds below sea-level in Holderness; (6) the condition of the land immediately west of the wolds during the Glacial Period; (7) the information required with reference to the chalk of Yorkshire, its fossil-zones; the thickness of its various beds, especially on the western edge, etc.; (8) the beds which directly underlie the chalk in different parts of the Riding; (9) the Lower Cretaceous series, i.e., Speeton Clay, etc.; (10) the Kimeridge Clay, etc.]. Trans. Hull Geol. Soc., Vol. 4, 1896-8, pp. 24-36.

G. W. Lamplugh. Isle of Man.

The Glacial Period and the Irish Fauna [refers to his work in the Isle of Man, which seems to indicate there was a connection with the island and the mainland during the Ice Age, and that the animals most probably crossed over on the ice]. Nature, 13th Jan. 1898, p. 245.

C. Lapworth. Yorkshire, Lincolnshire, etc.

Sketch of the Geology of the Birmingham District. With special reference to the Long Excursion [of the Geological Association] of 1898. With Contributions by Professor W. W. Watts, M.A., Sec.G.S., and W. Jerome Harrison, F.G.S. [W. Jerome Harrison's remarks on the Ancient Glaciers of the Midland Counties (pp. 400-408) contain references to the effect of the North Sea Ice Sheet on Yorkshire, Lincolnshire, etc.]. Proc. Geol. Assn., Aug. 1898, pp. 313-416.

J. Lomas. Cheshire.

On a Drift Section near Borough Road, Birkenhead. Proc. Liverp. Geol. Soc., Vol. 8, 1898, pp. 294-295.

Gavin Macdonald. York N.E., S.E.

How we get our Weather [with illustrations of large hailstones that fell at York and hill torn by waterspout at Langtoft]. Harmsworth's Mag., July 1898, Vol. 1, pp. 55-60.

H. E. Maddock. York S.E. and Linc. N.

Erratics on the Yorkshire and Lincolnshire Coast [pointing out that the boulders of the Yorkshire coast are continually being carried southwards across the Humber and along the Lincolnshire coast]. Naturalist, Aug. 1898, p. 245.

J. E. Marr. Isle of Man, York Mid W.

The Principles of Stratigraphical Geology [with many allusions to the North of England: e.g. the crush-conglomerates of the Isle of Man (pp. 80, 81); the Settle district specified as that best adapted for the study of field-geology (p. 95), etc.]. 8vo., 304 pp.; Cambridge, 1898.

John E. Marr. Lake District, York N.W., Mid W., S.W., etc.

The Development of British Scenery [arguing in favour of the Tertiary age of the main Pennine axis and of the dome-like uplift of the Lake District]. Science Progress, July 1898, Vol. 7 (N.S. Vol. 2), pp. 275-286.

Edward A. Martin. Cheshire.

The Elephant in Cheshire [giving various records of remains of *Elephas* from the 'Middle Sands' of Cheshire, extracted from a paper by G. H. Morton in Trans. Liverpool Biol. Soc., Vol. 12]. Science Gossip, July 1898, p. 58.

Edward A. Martin [not signed]. York Mid W. and S.W.

Yorkshire Carboniferous Flora [review of the Sixth Report of the Fossil Flora Committee of the Yorkshire Naturalists' Union; names of nine new records to the county are given]. Science Gossip, May 1898, p. 357.

E. A. Martin. Linc. S.

Artesian Well at Bourn [to a depth of 134 feet, with a flow of 5,011,200 gallons per diem; the rocks passed through were:—Alluvial and Fen Beds 9½ feet, Cornbrash 6½ feet, Great Oolite Series, 60 feet, Lincolnshire Oolite 58 feet]. Sci. Goss., Oct. 1898, p. 143.

James Eardley Mason. Cheshire.

Erratic Boulder in Cheshire [note recording a large sub-angular block of granite (?) at Old Alderley]. Naturalist, March 1898, p. 83.

L. C. Miall. Yorkshire [Mid W.?].

A Yorkshire Moor [brief geological notes]. Nature, 18th Aug. 1898, pp. 377-380; and Nature, 25th Aug. 1898, pp. 401-404.

John Milne. See 'A. J. Jukes-Browne.'

J. R. Mortimer. York S.E.

A Summary of what is known of the so-called "Danes' Graves," near Driffield [refers to the literature on the subject and describes recent excavations in these British tumuli]. Proc. Yorks. Geol. and Polyt. Soc., 1898, pp. 286-298, and two plates.

J. R. Mortimer. York N.E.

Report on the opening of a number of the so-called "Danes' Graves" at Kilham, E.R. Yorks., and the discovery of a chariot-burial of the Early Iron Age. Proc. Soc. Antiquaries, Vol. 17, No. 1, Nov. 1897 to June 1898, pp. 119-128.

J. R. Mortimer. York S.E.

"The Danes' Graves" [describing these prehistoric burial mounds near Driffield, and their contents]. Ann. Report Yorks. Phil. Soc. for 1897, publ. 1898, 10 pp. and plates.

G. H. Morton. Cheshire.

The Elephant in Cheshire. Trans. Liverp. Biol. Soc., Vol. 12, pp. 155-158, Plate 10.

G. H. Morton. Lanc. S., Cheshire.

Buried Bones about Liverpool. Trans. Liverp. Biol. Soc., Vol. 12, 1898, pp. 147-154.

Henr. Munthe. Cheshire.

On the Interglacial Submergence of Great Britain. 1. The Marine Clay at Cleongart, Kintyre, S.W. Scotland. 2. The Marine Clay at Clava, near Inverness, Scotland [briefly refers to Cheshire]. Bull. Geol. Institution of the University of Upsala, Vol. 3, Part 2, No. 6, 1897, publ. 1898, pp. 369-411.

Percy L. Parker. Cheshire.

In a Disappearing Cheshire Town. The Strange Story of Northwich [a general account (illustrated) of the effects of the 'salt subsidences,' with particulars of the quantity of salt obtained from the rocks of the neighbourhood, etc.]. Harmsworth's Magazine, Aug. 1898, Vol. 1, pp. 166-171.

Albert Henry Pawson. Lake District.

The Lake Country [contrasting the English Lake District, 'the mountain land in miniature,' with the 'stern and awful' heights of the Alps]. Naturalist, Jan. 1898, pp. 1-4.

Edward Adrian Woodruffe-Peacock. Linc. S.

Lincolnshire Naturalists' Union at Grantham [examined some Romano-British Pottery, etc., recently found at Grantham]. Naturalist, Aug. 1898, pp. 241-245.

Edward Adrian Woodruffe-Peacock. Linc. N.

Lincolnshire Naturalists at Linwood Warren [geology briefly noted on p. 51]. Naturalist, Feb. 1898, pp. 49-51.

C. T. Pratt. Yorkshire ? S.W.

[Boulders at] Banks Bottoms, Noblethorpe [in 'The Yorkshire Boulder Committee and its Eleventh Year's Work']. Naturalist, Dec. 1898, p. 353.

Henry Preston. Linc. S.

Geology South of Grantham. A paper read at the Meeting of the L.N.U. at Grantham, 7th June 1898 [the 'Plateau Gravels,' 'Lincolnshire Limestone,' 'Northampton Sands,' and 'Upper Lias Clay' described in detail, and lists of fossils given; with sketch map and two sections]. Naturalist, Aug. 1898, pp. 247-255. A Note, bearing on the above paper, appears in Naturalist, Sept. 1898, p. 258.

Henry Preston. Linc. S.

A Grantham Boulder [note recording a large boulder of porphyritic Dolerite recently unearthed near Grantham; a petrological description is given by J. J. H. Teall]. Naturalist, June 1898, p. 176.

Joseph Prestwich. See 'H. B. Woodward.'

Edward L. Ransome. Lanc. W.

Boulders of Shap Granite at Morecambe Bay [note recording boulders of Shap Granite and Carboniferous Limestone in Morecambe Bay; some of them are ice-scratched]. Naturalist, March 1898, p. 88.

T. Mellard Reade. Lanc. S.

[Very large boulder of Gypsum at Great Crosby, Liverpool]. Nature, 9th June 1898, p. 132.

T. Mellard Reade. Lanc. S.

The Gypsum Boulder | of Great Crosby: | its History and Meaning. | By | T. Mellard Reade, | . . | . . | . . | . . | . . | . . | Liverpool | . . | 1898 [a large boulder of gypsum, weighing about 18 tons, probably from Whitehaven, was found in a brick-pit at Great Crosby; it has now been erected on a pedestal at Great Crosby in its natural position]. 12 pp. and plate.

T. Mellard Reade. Lanc. S., Cheshire.

Post-Glacial Beds exposed in the Cutting of the new Bruges Canal [abridged; enumerates the various beds exposed and correlates them with those 'in Lancashire and Cheshire which overlie the Peat and Forest Bed']. Quart. Journ. Geol. Soc., Vol. 54, Aug. 1898, pp. 575-581; abstract in Geol. Mag., Aug. 1898, pp. 375-6.

T. Mellard Reade. Lake District.

High-Level Marine Drift at Colwyn Bay [abstract; the drift contains Eskdale and other Lake District rocks]. Quart. Journ. Geol. Soc., Vol. 54, Aug. 1898, pp. 582-584.

F. R. Cowper Reed. Linc. N.

Note on a Large Boulder at Wimpole Hall, Cambs. [of Spilsby Sandstone, containing an Ammonite 'not referable to any species which has hitherto been recorded from Great Britain,' but is 'closely related to *Olcostephanus* (*Craspedites*) *subditus*]. Geol. Mag., June 1898, pp. 267-268.

F. R. Cowper Reed. Westmorland.

Blind Trilobites [includes *Illænus cæcus* (Holm.) and *I. galeatus* (Reed), p. 500; and *Cyphoniscus socialis* (Salter) and *Tiresais* (McCoy), p. 502, from the Keisley Limestone]. Geol. Mag., Oct. 1898, pp. 439-447, Nov., pp. 493-506, and Dec., pp. 552-559.

F. R. Cowper Reed. Lake District.

***Placoparia* from the Skiddaw Slates [adds another example to the** list given by Miss G. L. Elles in a previous number]. Geol. Mag., May 1898, p. 240.

S. H. Reynolds. See 'C. I. Gardiner.'

W. D. R[oebuck]. York N.W.

[Review of] Romantic Richmondshire, by Harry Speight. Naturalist, Jan. 1898, pp. 29-32.

Wm. Denison Roebuck. York S.E.

Bibliography: Papers and records published with respect to the Natural History and Physical Features of the North of England. Land and Freshwater Mollusca, 1892 and 1893 [includes record of *Limnæa stagnalis* in old lacustrine deposit near Withernsea, etc.]. Naturalist, June 1898, pp. 189-192, and July, 193-199.

Wm. Denison Roebuck. Lancashire, Lake District, etc.

Bibliography: Papers and records published with respect to the Natural History and Physical Features of the North of England. Mammalia, 1892 [includes references to notes recording remains of deer, etc., in peat deposits]. Naturalist, Feb. 1898, pp. 61-64; and March, pp. 65-71.

Harold Sales. York S.E.

Section in the Chalk at Willerby [brief abstract of notes read to the Hull Geol. Soc.]. Trans. Hull Geol. Soc., Vol. 4, 1896-8, pp. 21-22.

R. F. Scharff. Isle of Man.

The Glacial Period and the Irish Fauna [criticism of G. W. Lamplugh's letter in Nature, p. 245]. Nature, 10th Feb. 1898, pp. 341-342.

A. C. Seward. North of England.

Fossil Plants. For Students of Botany and Geology. Vol. 1, 8vo., pp. xviii.+452, with 111 illustrations. Cambridge, 1898 **[not seen]**. Reviewed in Geol. Mag., May 1898, pp. 228-232, and by Henry C. Cowles in Journal of Geology (Chicago), Vol. 6, No. 4, May-June 1898, pp. 436-438.

Thomas Sheppard. York S.E.

The Hessle Chalk Quarries [a general description of the fossils, etc., to be obtained from the chalk quarries near Hull]. 1898 (reprint of 8 pp.).

Thomas Sheppard. York S.E.

Notes on a large Pair of Antlers of the Red Deer (*Cervus elaphus*) from the Peat at Hornsea [describing a skull and antlers and other remains found by Messrs. Morfitt, of Atwick; measurements given]. Trans. Hull Scientific and F.N. Club, Vol. 1, No. 1, 1898, pp. 22-23, and plate I. (frontispiece).

Thomas Sheppard. York S.E.

Origin of the Humber Mud [considers that the whole of the mud in the Humber estuary and on its banks has not been carried down the rivers flowing into the estuary, but that part has been derived from the waste of the Holderness cliffs]. Science Gossip, June 1898, pp. 7-9: see also editorial headed "Humber Mud" in Natural Science, Aug. 1898, pp. 82-83.

Thomas Sheppard. York S.E.

Traces of an Ancient Lake-Dwelling at Sand-le-Mere, near Withernsea, East Yorkshire [refers to previous accounts of Holderness Pile Dwellings, and describes some artificially pointed piles, etc., found in the peat bed at Sand-le-Mere]. Naturalist, Oct. 1898, pp. 301-303.

Thomas Sheppard. York S.E.

Remains of the Red Deer, from the Peat Bed at Withernsea [describing a skull and vertebræ found by T. Pygas]. Naturalist, Oct. 1898, p. 304.

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THOMAS SHEPPARD. NOTTINGHAMSHIRE.

Bones of a Whale in the Trent Valley near Newark [pieces of the lower jaw, over 7 feet in length, dug up on the banks of a waterway 1¼ miles south-west of Newark Station]. Naturalist, Oct. 1898, p. 304.

THOMAS SHEPPARD. YORK S.E.

The Origin and the Contents of the Gravels around Hull [summary of a paper read to the Hull Geological Society; the gravels are divided under three heads, viz., Pre-Glacial, Glacial, and Post-Glacial]. Trans. Hull Geol. Soc., Vol. 4, 1896-8, p. 21.

THOMAS SHEPPARD. ALL THE NORTHERN COUNTIES.

Bibliography: Papers and Records published with respect to the Natural History and Physical Features of the North of England. Geology and Palæontology, 1893 [titles and abstracts of 243 papers, etc., published during 1893 and of papers omitted from previous lists]. Naturalist, Sept. 1898, pp. 271-288, and Oct. 1898, pp. 289-296.

THOMAS SHEPPARD. YORK N.E., S.E., AND LINC. N.

Bibliography, 1896-1897. List of papers referring to the Geology, etc., of the East of Yorkshire and North Lincolnshire, which have been published during 1896 and 1897 [the most important papers only referred to (21 in all) and abstracts given]. Trans. Hull Geol. Soc., Vol. 4, 1896-8, pp. 37-39.

T. SHEPPARD. YORK S.E.

Hull Scientific and Field Naturalists' Club [report of excursion to Atwick and Skipsea; the geological collections of Messrs. Morfitt at Atwick referred to]. Sci. Goss., Aug. 1898, p. 95.

T. SHEPPARD. YORK S.W.

Hull Scientific and Field Naturalists' Club [report of meeting; bones of Red Deer, etc., from the peat at Goole described]. Science Gossip, June 1898, pp. 30-31.

THOMAS SHEPPARD [not signed]. YORK MID W., S.E. AND N.E., LINC. N.

Excursions [of the Hull Geological Society] during 1896 [to Bridlington under the guidance of G. W. Lamplugh, on Easter Monday, the glacial sections south of the town visited; to North Ferriby and Swanland on 2nd May, sections in the Boulder-clay and Middle and Lower Chalk seen; to Withernsea on 16th May, to examine the erratics on the coast; to Louth on Whit-Monday, important sections in the Glacial beds and Lower and Middle Chalk described, and numerous Scandinavian boulders recorded; to Beverley on 13th June, *Marsupites ornatus* recorded from the chalk; to Selby with the Yorkshire Naturalists' Union on 20th June, the Glacial beds in the Vale of York examined; to Driffield on 4th July, sections in the chalk and drift examined and J. R. Mortimer's museum visited; to Ilkley on 25th July, when the Glacial striæ on the Millstone Grit of Ilkley Moor were pointed out by P. F. Kendall; to Whitby and Staithes, with the Yorkshire Geological Society and Yorkshire Naturalists' Union, 31st July to 3rd August, sections in the Lias, etc., visited; to Kirmington and Croxton in Lincolnshire on 22nd August, sections in the glacial beds examined; Paull on 16th September, sections in the drift]. Trans. Hull Geol. Soc., Vol. 4, 1896-8; pp. 6-9.

YORK MID W., S.E., N.E., WESTMORLAND,
T. SHEPPARD AND J. W. STATHER [not signed]. LINC. N.

Excursions [of the Hull Geological Society] during 1897 [to Leeds, on 27th February, to examine the Yorkshire College collections; to Appleby-on-the-Eden, during Easter holidays, by the invitation of P. F. Kendall, the Shap Granite, Brockram, etc., examined; to Little Weighton, with the Hull Field Naturalists' Club, on 1st May, sections in

the chalk and evidences of glaciation; to High Towthorpe and Sledmere, with the Rev. E. M. Cole, on 15th May, the 'Fairy Stones' and sections in the chalk; to Barton and South Ferriby, on 20th May, details of beds exposed in a brick-pit, and particulars of a boring given; to Donnington-on-Bain (Lincs.), on Whit-Monday, interesting sections in the Lower Cretaceous Rocks and Chalky Boulder Clay; Hornsea, on 3rd July, details of a cliff section given; to Scarborough and Hackness, 8th and 10th July, with Yorkshire Geological Society and Yorkshire Naturalists' Union; to Kelk and Gransmoor, in Holderness, on 24th July, important glacial sections; to Newbald, Sancton, and Cliff, on August Bank Holiday, with Y.N.U., sections in Kellaways Rock and Lias examined and lists of fossils compiled; to Barrow-on-Humber, on 21st August, British earthworks; Drewton Cutting and Dale, 25th Sept., Kellaways Rock and St. Austin's Stone]. Trans. Hull Geol. Soc., Vol. 4, 1896-8, pp. 11-17.

HARRY SPEIGHT. YORK N.W.

Glacial Boulders in Swaledale [Basalt; one built into an old wall]. Naturalist, Oct. 1898, p. 307.

JAMES SPENCER. YORK S.W.

The Halifax Coal Strata [details of the various beds and lists of fossils characteristic of each are given]. Proc. Yorks. Geol. and Polyt. Soc., 1898, pp. 302-310, and plate.

JOHN W. STATHER. YORK S.E.

A Glaciated Surface at Filey [several new exposures of striæ on the Oolitic beds north of the Brigg described; the direction being chiefly from N. 20° E.]. Proc. Yorks. Geol. and Polyt. Soc., 1898, pp. 346-349, and plate.

JOHN W. STATHER. LINC. N.

Erratic Boulders in Lincolnshire [agreeing with F. M. Burton that great caution should be exercised in recording boulders, and giving examples of boulders having been artificially placed upon the land]. Naturalist, Jan. 1898, p. 10.

J. W. STATHER. YORK S.E.

[Boulders in] Holderness and South [? North] Ferriby [in 'The Yorkshire Boulder Committee and its Eleventh Year's Work'; records Baltic boulders in the Holderness clays, and *Belemnitella lanceolata* (Schloth.) in the Boulder Clay on the north side of the Humber]. Naturalist, Dec. 1898, p. 356.

J. W. STATHER. YORK S.E.

The Northern Escarpment of the Wolds [abstract of paper read to the Hull Geol. Soc.; gives details of section in the Lower and Middle Chalk (with the 'Black band') at Flixton, near Hunmanby]. Trans. Hull Geol. Soc., Vol. 4, 1896-8, p. 22.

J. W. STATHER, Secretary. LINC. N., YORK S.E.

Report of East Riding Boulder Committee, 1897 [records Scandinavian rocks at Louth; Post-archæan granite of Angermanland or S.W. Finland, in the Holderness clays; *Belemnitella lanceolata* (Schloth.) in the Boulder Clays of Holderness and South Ferriby (this species has not been recorded in the Yorkshire Chalk); and a large boulder of Estuarine Sandstone at Scarborough]. Trans. Hull Geol. Soc., Vol. 4, 1896-1898, p. 5.

J. W. STATHER [not signed]. YORK S.E., LINC. N.

Notes [on specimens exhibited before the members of the Hull Geological Society; include an ancient British skull, etc., found at Brough by T. Sheppard; and the fin of a teleostian fish, *Protosphyræna ferox*, found by W. H. Crofts and J. W. Stather in the chalk at South Ferriby]. Trans. Hull Geol. Soc., Vol. 4, 1896-8, p. 23.

J. W. Stather. See 'Thomas Sheppard.'

[M.] Stirrup. Lanc. S.

Fossil Remains in the Lancashire Coalfield [urging the proprietors of collieries, etc., to send specimens to the Society]. Trans. Manch. Geol. Soc., Vol. 25, Part 21, 1898, pp. 281-282.

Aubrey Strahan. Linc. N.

"The Geology of the Isle of Purbeck and Weymouth" [Memoir of the Geological Survey; compares the formations in the South of England with their equivalents in the North]. Pages xi. + 278, seven plates, map, and sections **[not seen]**. Reviewed in Geol. Mag., April 1899, pp. 167-173.

A. Strahan. Cheshire.

Supplement to the Geology of the Neighbourhoods of Flint, Mold, and Ruthlin [records a series of borings which have been put down in the reclaimed portion of the Dee estuary, which prove the existence of Upper Coal-Measures, which nowhere appear at the surface, and which were not previously known to be present in Flintshire or West Cheshire]. Memoirs of the Geological Survey, 1898, Part 7. Reviewed in Geol. Mag., Dec. 1898, p. 573.

C. Fox-Strangways. York N.E. and S.E.

Notes on the Coast Sections between Hayburn Wyke and Filey [prepared for the summer excursion of the Yorkshire Geological and Polytechnic Society to Scarborough in 1897]. Proc. Yorks. Geol. and Polyt. Soc., 1898, pp. 356-357.

C. Fox-Strangways. York S.E.

Filey Bay and Brigg [description of the beds shown in eight excellent photographs of the Filey neighbourhood, by Mr. Godfrey Bingley, which accompany the paper]. Proc. Yorks. Geol. and Polyt. Soc., 1898, pp. 338-345.

C. Fox-Strangways. Linc. N., Derbyshire.

Sections along the Lancashire, Derbyshire, and East Coast Railway between Lincoln and Chesterfield [the portion of the line dealt with runs at right angles across the strike of all the beds from the Lias to the Coal Measures; and each formation is dealt with in detail]. Quart. Journ. Geol. Soc., Vol. 54, May 1898, pp. 157-168 (plans and sections); abstract in Geol. Mag., Feb. 1898, pp. 93-94.

R. H. Tiddeman. York Mid W.

Geology of Bowland Knotts [a leaflet ('Supplement to Circular') distributed to the members of the Y.N.U. at the Clapham Meeting on 14th May 1898]. Printed by the Yorkshire Naturalists' Union, 1898.

Warren Upham. Lake District.

Valley Moraines and Drumlins of the English Lake District. American Geologist, Vol. 20, 1898, pp. 165-170.

Leveson Francis Vernon-Harcourt. Lanc. S. and Cheshire.

Formulary of the Characteristic Particulars about a Tidal River with application to the rivers Húgly and Mersey [giving rise, volume, and velocity of tides, nature of bed, position of bars, and other particulars]. 8vo., 23 pp. and two plates, VII. Intern. Congr. on Navigation, Brussels, 1898.

F. F. Walton. York S.E.

New Section in the Hessle Gravels [note drawing attention to a new cutting in these gravels]. Trans. Hull Geol. Soc., Vol. 4, 1896-8, p. 10.

F. F. Walton. York S.E.

Echinoderms of the Yorkshire Chalk [brief abstract of notes read to the Hull Geological Society]. Trans. Hull Geol. Soc., Vol. 4, 1896-8, pp. 22-23.

W. W. Watts. Northern Counties and Isle of Man.

Geology | for Beginners | by | W. W. Watts, M.A., F.G.S. | . . . | . . . | . . . | . . . | . . . | London. Macmillan & Co. Ltd. | . . . | 1898 | . . . [contains numerous illustrations from photographs of geological features in the northern counties and the Isle of Man; and explanations in the text]. Pages xvii. + 352.

Arthur Smith Woodward. York N.E.

On the Fossil Fishes of the Upper Lias of Whitby. Part III. [describes and figures various examples of *Lepidotus semiserratus* Agassiz, all of which are in the British Museum]. Proc. Yorks. Geol. and Polyt. Soc., 1898, pp. 325-337.

Arthur Smith Woodward. ? Yorkshire.

Outlines of Vertebrate Palæontology for Students of Zoology. 8vo., pp. xxiv., 470, with 228 illustrations in the text. Cambridge: at the University Press, 1898 **[not seen].** Reviewed in Geol. Mag., Aug. 1898, pp. 367-373.

A. Smith Woodward. Yorkshire, etc.

The History of the Mammalia in Europe and North America [refers to the Pleistocene deposits of Yorkshire and their contents]. Natural Science, May 1898, pp. 328-336.

Henry Woodward. Derbyshire.

Note on the Antlers of a Red-Deer (*Cervus elaphus*, Linn.) from Alport, Youlgreave, near Bakewell, Derbyshire—now in the British Museum (Natural History), Cromwell Road, London [a specimen of unusually large size which has recently been rehabilitated and exhibited in the Geological Gallery; they were originally described in Phil. Trans. Royal Soc. for 1875 (p. 353)]. Geol. Mag., Feb. 1898, pp. 49-51, with plate.

Henry Woodward. See 'T. Rupert Jones.'

H. B. Woodward [edited by]. Linc. S., York S.W., Durham.

Memoranda chiefly on the Drift Deposits in various parts of England and Wales; being extracts from the Notebooks and other MSS. of the late Sir Joseph Prestwich, M.A., D.C.L., F.R.S., etc. [refers (p. 405) to the fresh-water deposit at Casewick in Lincolnshire; the Hippopotamus remains from Wortley, near Leeds (pp. 416-417); the glacial beds near Newcastle (p. 417), etc.]. Geol. Mag., Sep. 1898, pp. 404-417.

H. B. Woodward. Linc. N.

Boulders of Spilsby Sandstone [a letter giving additional particulars of transported masses of this rock in Eastern England]. Geol. Mag., July 1898, pp. 334-335.

D. Woolacott. Durham.

An Explanation of the Claxheugh Section (Co. Durham) [abstract; describing a peculiar section in the Permian Yellow Sands]. Quart. Journ. Geol. Soc., Vol. 54, Feb. 1898, p. 14; and Geol. Mag., 1897, p. 377.

D. Woolacott. Durham.

On a Portion of a Raised-Beach on the Fulwell Hills, near Sunderland [140 feet above sea-level, consisting of coarse gravel passing up into sand]. Nat. Hist. Trans. Northumb., Durham, and Newc., Vol. 13, pp. 165-170, pl. 6.

WETHERBY RE-VISITED BY THE YORKSHIRE NATURALISTS.

F. ARNOLD LEES, M.R.C.S., ETC.,
Meanwood Lodge, Leeds.

SOME might say that the Union's 'field-day' at Wetherby, 'for the investigation of the Wharfe from Collingham Bridge to Flint Mill, Stockeld Park, Linton, etc.,' on an unfortunately-altered date (Saturday, 20th July 1901), had 'Fiaso to its friend.' There would be apparent truth in the epigram, though really and scientifically the ramble was not void of results. Little was expected, and the unlooked-for did not befall on the occasion. Seldom has a set-search proved so sterile of the New. The summerland has ever an inexhaustible variety of interest, the little secrets of bird, of insect, of earth-life, albeit known to the eye, can never be re-known too often; and much was seen which had at least the value of crystallising ideas amorphous or nebulous before as to the history of the Wharfe gorge: its dead rock and quick incolæ. For some of the attending naturalists—18 all told—it was, too, a day of pre-eminent Comparisons. Yet small as the gathering was, the day had its sad note in the absence (for evermore) of an old and honoured officer—the late John Emmet, F.L.S., of Boston Spa, whose ageing figure must surely have been in the mind of more than one even of the newer-school men present. In field-work, too, Comparisons are neither odious nor operose—on the contrary they are fruitful in conclusions. Twenty years and more had passed since 'the merry men' of the Union tramped this particular bailey of greenwood and sward, under the guidance of more than one 'lost leader,' Dr. H. Franklin Parsons among the rest; and the material—in the Botanic department at least—was not wanting for a demonstration of exactly how much and how little difference a quarter of a century makes in the aspect of any area for which full and reliable data of an earlier and an intermediate time have been preserved to us.

As the rock which makes soil in which plants grow and on which Life subsists is the basis of all things, the natural way is to take the Geological Report first. As neither the President nor the Secretaries of the Section were present, the record (furnished by Mr. Edwin Hawkesworth) has to be regrettably, and to me unaccountably, brief. Although, as I understand, the 'Lower Magnesian' limerock of the district is infossilous

1901 November 1.

and so lacks the provision of 'specimens' which can be carried home, arranged and named, there appeared to be much of the minute and interesting about the strata as seen in the slope of the new railway cuttings which was *not* certainly known, if unanswered questions of tyro-geologists afford any criteria, although those examining the sections under the guidance of Mr. Catley, the North Eastern Railway Co.'s Tadcaster District Engineer, who was forethoughtfully sent to further investigation, had the advantage of the presence of the Rev. W. L. Carter. To him, however, the district was quite new, so that the writer and others had to be content with the information given in the Circular, and the additional facts that the trenches or joints (a foot or more in width) overlying the rifts and internally-crystallised cracks in the yellowish, crumbly lime-rock itself, were of post-geologic age ('artificial'—possibly due to the Kelt or Gaul) and that the 'sandy material' with which these joints were filled, albeit seeming wholly siliceous, had been 'burnt for lime.' That no experts, specially trained observers, were present, was therefore trebly a pity: the occasion and the mixed character of the appearances in the cutting by the new railway station ill-accounting for the neglect which remains its portion. Old stone hand-mills (querns) have been unearthed, too, in making the rail-branch curve, and the opportunity of learning all that could be learnt should not have been lost.

'To the majority of geologists the district does not offer many attractive features. For some reason or other, probably the lack of fossils being the chief, the Permian rocks of Yorkshire have been severely neglected, though they present many interesting problems for solution, especially that of their origin and mode of formation. These problems affect the chemist as well as the geologist, and it is gratifying to know they are now receiving the attention of a Committee of Research appointed by the Leeds Geological Association.

'The geological party was a very small one, and, unfortunately, was without a leader, neither were any of the officers of the Section present. The North Eastern Railway Co. have been widening their line and making a new station at Wetherby. In the course of this work extensive rock sections have been exposed, and the Company kindly gave permission for these to be examined, at the same time instructing their local engineering inspector to act as guide. The sections show the Lower Magnesian limestone well. This is a yellow limestone, very soft and sandy in places, and not very thickly bedded. There are

also thin layers of marl intercalated. The most interesting feature was the wide, irregular joints exposed. Most of these do not extend to the surface, and some of them would average a foot in width. Their mode of formation gave rise to discussion, being variously attributed to contraction, slipping of the beds, and the action of water. Similar joints running to the surface have been filled with sandy material. The limestone contains a large number of irregularly-shaped cavities, lined with crystals.' This is Mr. Hawkesworth's account.

According to the route sketched out in the circular by Mr. A. R. Dwerryhouse, the party should have proceeded by train to Thorp Arch to examine the gorge of the Wharfe between there and Wetherby, but, after examining the railway sections, it was too late for the train, and the heat was too excessive to admit of walking, so the geologists joined the botanists, and had a quiet stroll through Linton, on the banks of the Wharfe, to Wetherby.

Mr. Arthur R. Dwerryhouse, B.Sc., F.G.S., wrote that good sections of the Lower Magnesian limestone are to be seen in the gorge of the river at Falcon Cliffs (?), where there are good examples of contortions produced by irregular solution of the limestone. Under favourable conditions the Middle Marls may be seen nearer to Wetherby, but in the case of clear sections not being available their position is indicated by a widening of the gorge. This gorge is one of a series which were produced during the Glacial Period by the deflection of the pre-glacial streams by the Vale of York Glacier. The pre-glacial river passed out into the Vale of York over the site of the town of Wetherby, deep excavations for sewerage purposes having been made in the town without touching the bed-rock.

During the whole day there were but two bands abroad. One, alighting at Wetherby, first visited the new railway works, which is to give a shorter route to Harrogate from the Thorner line, and then proceeded to Linton bridge and back to the Gasthaus—an 'Angel' in this case—by the winding bank of Wharfe, here brimming and somewhat sullen of flow, even after long weeks of rainless sky.

Those members of the party who alighted at Collingham worked their way towards Wetherby along the Collingham bank of the Wharfe, and after passing Wetherby went a short way along the north bank towards Flint Mill.

Mr. Riley Fortune, F.Z.S., reported that the members of the Vertebrate Section were at this meeting chiefly conspicuous by

their absence, the President (Mr. W. Denison Roebuck, F.L.S.) and two Secretaries (Mr. Fortune and Mr. Kenneth McLean) being the only representatives.

Owing to the excessive heat very little work was done, the only item of importance being the discovery by Mr. McLean of a breeding-place of the Rock-Dove. In all 42 species of birds were observed, 7 mammals, and 5 fishes, the following being the list:—

MAMMALS.

Rabbit.	House Mouse.	Water Vole.	Fox.
Hare.	Shrew.	Mole.	

BIRDS.

Jackdaw.	Skylark.	Blue Tit.
Wood Pigeon.	Meadow Pipit.	Whitethroat.
Swift.	Tree Pipit.	Redstart.
Swallow.	Missel Thrush.	Sedge Warbler.
House Martin.	Willow Warbler.	Linnet.
Sand Martin.	Blackbird.	Wren.
Sparrow.	Song Thrush.	Pied Wagtail.
Rook.	Sandpiper.	Grey Wagtail.
Starling.	Partridge.	Kestrel.
Greenfinch.	Pheasant.	Carrion Crow.
Yellow Bunting.	Dipper.	Lapwing.
Hedge Accentor.	Chaffinch.	Waterhen.
Whinchat.	Robin.	Stock-Dove.
Spotted Flycatcher.	Great Tit.	Rock-Dove.

FISHES.

Minnow.	Trout.	Eel.	Dace.	Chub.

In the absence of all the officers of the Conchological Section, Mr. W. Denison Roebuck, F.L.S., reported. He stated that the extreme heat and especially the dryness militated so much against the collection of land mollusca that the only species observed were *Helix aspersa* represented by broken shells in Collingham Bank Wood, and *H. cantiana* and *H. virgata*, found near Wetherby by Mr. M. Lawson Thompson, the two latter being species which do not hide themselves in dry weather, but remain on the vegetation exposed to the fiercest solar heat. Of course no slugs were observed, and of water mollusca all that were collected were *Physa fontinalis* and *Sphærium corneum*, both found commonly amongst *Chara fragilis* in the Wharfe at Wetherby by Mr. C. A. Rider, of Bingley.

The entomologists were few in number, and among the Lepidoptera nothing of note was netted. The withered flower-heads of the Lady's-finger Vetch (*Anthyllis vulneraria*) were collected by some of the party, off the railway banks, where the

Little Blue (*Chrysophanus minimus*) abounds in early June, with a view to 'breeding' the least British Butterfly. The pinky larva embeds itself cosily among the 'flocks' of the capitulum, and hybernates there, pupating in April, early or late according as her calenture is pronounced or deferred; to wing itself, a living, fluttering bit of sky, as if dropt out of the azure, about the gay, grassy slopes and banks which, above a yard or two, it never leaves. Its small size and weak wing power makes it extremely 'local.' Up to 1881 it used to abound in a dozen or more places on the rail-line side, a hundred yards or so west of Wetherby Station, and at intervals in the 'bays' of the cuttings, for a mile Linton way and Spofforth way; in Kirk Deighton quarry likewise, in thousands; and, singular to say, is capable of being established where it has *not* 'got to' if a big patch of its food-plant can be found, e.g., on the kidney vetch area close to Starbeck Station. How suggestive, that a tiny thing like this can persist and perpetuate—yet not get away! Its food-plant is a calcicole, yet does grow on sandstone soil, but only where it has been carried: a rare case, and parallelling the fly that needs it. Surely we have here a 'Light' on the causes—the hidden laws that rule the constitution and distribution of living atoms? On the aquatic Figwort (*Scrophularia*) by the bridge at Linton some larvæ of a *Cucullia*, nearly full-fed, blue-green and yellow, black-barred, were found. Whether *C. verbasci* or *C. scrophulariæ* must remain undetermined until the imagos emerge.

Mr. M. Lawson Thompson went over the ground between Wetherby and Collingham Bridge, meeting with the following species of Coleoptera. They are all more or less common beetles, and were found in their respective habitats:—

Pterostichus vulgaris L.
Calathus cisteloides Panz.
Anchomenus albipes F.
Bembidium punctulatum Drap.
Trechus minutus F.
Orectochilus villosus Müll.
Helophorus brevipalpis Bedel.
Cryptopleurum atomarium F.
Homalota elongatula Grav.
Philonthus trossulus Nord.
Oxytelus rugosus Grav.
Oxytelus tetracarinatus Block.
Adalia bipunctata L.
Coccinella 22-punctata L.
Brachypterus pubescens Er.
Brachypterus urticæ F.
Meligethes æneus F.
Lathridius lardarius DeGeer.
Enicmus transversus Ol.
Atomaria analis Er.
Elmis æneus Müll.
Adrastus limbatus F.
Rhagonycha fulva Scop.
Lema lichenis Voet.
Chrysomela lamina F.
Phædon tumidulus Germ.
Longitarsus jacobææ Wat.
Phyllotreta nemorum L.
Sphæroderma testaceum F.
Crepidodera transversa M.

Crepidodera ferruginea Scop.
Plectroscelis concinna Marsh.
Cassida viridis F. (larva).
Anthicus floralis F.
Apion apricans Herbst.
Apion virens Herbst.
Sciaphilus muricatus F.
Phyllobius oblongus L.
Phyllobius viridiæris Laich.
Mecinus pyraster Herbst.
Cionus scrophulariæ L.
Cionus blattariæ F.
Cœliodes quadrimaculatus L.
Ceuthorrhynchus pollinarius Forst.
Rhinoncus perpendicularis Reich.

The botanical scouts formed a thin, perspiring line of six or seven, their route from the new station cutting having been already indicated. Fifty species of plants or so were seen in flower—the only novelty was *Centaurea nigra* var. *radiata,* the ray-floretted form of the common Horse-knop—a plant with more common or garden aliasses than almost any other in the vernacular. Not such a calcifuge (lime-shunner) as the Foxglove, it is yet always finest and most rayless on stiff or sandy soils, upon limestone tending, in the frequency with which it arrays itself, to the style of its handsome congener (*C. scabiosa*). In this I see a hint at some hybridic influence, for *C. scabiosa* is a true xerophile, lime-lover, not occurring on cold sandstone soil. Field botanists of late years have shown many more 'varieties' to be really hybrids than was even suspected up to 1870. *Knautia arvensis,* the 'Gipsy Rose' of the Ainsty, and quite the favourite buttonhole of the young Romany for its lasting rosette-like quality, was in unaccustomed profusion of lavender and mauve, on and in the neighbourhood of the old Race-course ings. The 'Water-Thyme'—who manufactures these inept names, one wonders—the botanic 'book-makers'?—in the Wharfe bending about the same arena, was seen in blossom, exserting the long-as-needed tube of its ♀ flower above the unusually low surface-level of the water. This was another not previously recorded observation. The abbreviated ♂ flower, produced where this American water-weed (*Elodea canadensis*) creeps over laved mud, has not been found in Yorkshire, but it is conceivable that a tropical season with an extremely long drought may sometime produce it, as the plant is not truly and fully dicœcious—the sexual organs ♂ and ♀ borne on distinct plants; every joint of a plant will multiply under ordinary conditions of water-warmth, and the female-flower envelopes contain staminal filaments which are abortive —vice versâ with the male-blossom style, which, however, I have not actually seen.

The full lists of the Sectional Secretaries are not worth the space they would occupy. No species but those named were

not already on record. The Hop (fruiting) and the *Œnanthe fistulosa, Conium, Rosa spinosissima, Reseda lutea, Asperula cynanchica,* and *Carex acuta* were noted, all in their Flora stations, still undiminished though not increased. The *Scirpus acicularis* of the Ings brook appeared to have vanished; *Salvia verbenaca* seemed nearly 'done for' by the field wall near the Union-house, although not so its close neighbour *Verbena*, for *it* can bear trampling upon by many feet. The curious form of the Perfoliate Pondweed (*Potamogeton perfoliatus* var. *Jacksoni*) (1596 × c. Lond. Cat. Edn. 9th) discovered in a pool at Linton by Mr. John Jackson in 1881, would seem to have disappeared, too, owing to alterations; but as it has one other locality in the fens, and has been determined by Mr. A. Fryer to be a hybrid, pollinated by the crimped-leaf Pondweed (*P. crispus*) with which it so often grows, it is almost sure to reward special search for it under Linton Bridge. Many of these things are not really rare—one has only to 'go' for them with serious alertitude; and lo! after the initial maze of tangle has been secerned and sorted—three or four 'species' at one haul—there it is, the nameable, differentiated article—and the collector is satisfied and happy! This is a parable.

Near the head of the alluvial Ings level, the North African *Lycium barbarum,* 'False Tea-tree,' a good 'quickset' for hedges, introduced because it will bear maltreatment and form a good fence, has established itself, probably bird-sown, and acquired the rights of a wilding; whilst a much older 'simple,' or potherb, in use by the Norman—the Sand Leek (*Allium arenarium* or *Scorodoprasum*) has very greatly increased during the last twenty years by the banks of Wharfe on the west or northern side. Very handsome its rose umbels and capitula of purple bulbils, topping its broad leaves, showed; in clumps about winter-flood mark, where year after year, in this creek or by that backwash bank they had been Nature planted! It is one of the plants that, like the other Alliums, *Schœnoprasum* and *Babingtonii,* may be either indigenous, or a very, very old introduction. About Abbeys, Norman earthworks, like Rougemont near Weeton, eight miles higher up the Wharfe, on its north bank, too, and the site of Harewood's first castle, such plants as this Garleek, Goutweed, etc., are commonly found to persist and, more than that—the significant factor—to increase in frequency and quantity lower down the nearest waterway.

With this exception, a river-borne influx, there might never be any natural change in the character of the flora to keep in

countenance the prediction of the Circular. The riparial was, as of old, teeming with vegetal suggestions of Old Time, in its long-ago introduced and now thoroughly-acclimatised elements. Besides the Sand-leek there was *Barbarea stricta,* or that unnamed form of *B. vulgaris* which has its siliques borne upright on short pedicels closely hugging the main stem; also the Hemp Agrimony (on the south bank of the river) with the planted alien *Hemerocallis fulva* before the weir reach is passed; that monachal simple the Goutweed, together with Tansy and Mugwort, both now counted as wild, yet cultivated by the first herbalists, and suggestively *not* found higher up the river than the Priory at Bolton. And wherever pockets or slides of sand or 'calcareous marl' belying its name, lay over the bedrock, as at the north-west angle of 'the Ings,' there *Geranium columbinum,* characteristic arenocole, was in evidence, just as at the not-visited Flint Mill three miles downstream: a proof that plants in their preferences provide an alternative key to the geology of the subsoil and glacial drift at least. The strict xerophilous calcicoles, *Asperula cynanchica* and *Brachypodium pinnatum,* Rock-cistus, and Carline thistle were only to be seen on their own fittest hearthstones, the rocky calcareous ground of Linton Common to the north-west of the bridge. Uprooted, washed-down by the river in spate, no shifting sand- or mud-bank, or wheresoever they were deposited, could be a home or even a temporary abiding place for these. This grand fact is about the only thing to be learnt from the multiform observances of the first Twentieth Century re-visit of the Union to ground made classic even in 1840, when Baines produced the first Flora, by a Dalton, a Denny, a Hailstone, an Ibbotson, and a Spruce.

NOTE on LINCOLNSHIRE SPIDERS.

Lincolnshire Spiders: Additional Records.—Since the publication of my list of 'Lincolnshire Spiders' in the September 'Naturalist' four additional species have come to hand which brings the number up to 158 Spiders occurring in the county.

Leptyphantes blackwallii Kulcz. = *L. terricola* C.L.Koch-Camb. = *Linyphia tenebricola* Wid.-Camb. = *L. terricola* Koch-Bl. = *L. zebrina* Menge-Camb.
N. 4. Irby, 18th July 1901, C. B. Parker.

Gongylidium fuscum Bl. = *Neriene fusca* Bl.-Cambr. = *N. agrestis* Camb.
N. 4. Grimsby, Clee, September 1901, A. Smith. 9. Humberstone, September 1901, A. Smith.

Epeira sclopetaria Clerck. = *E. sericata* Koch-Bl.
N. 4. Irby, 8th September 1901, C. B. Parker.

Oxyptila trux Bl.-Cambr. = *Thomisus trux* Bl.
N. 4. Irby, 29th August 1901, C. B. Parker.

—A. Smith, 5, Cavendish Street, Grimsby, 16th October 1901.

COPROPHILOUS FUNGI.

Abstract of Address delivered at Cadeby, 23rd September 1901, at the Yorkshire Fungus Foray.

GEORGE MASSEE, F.L.S., F.R.H.S.,

Royal Herbarium, Kew; Chairman of the Yorkshire Mycological Committee.

NOTWITHSTANDING the close and continued attention paid to the Yorkshire Mycologic Flora during the past quarter of a century by members of the Y.N.U., much—very much—remains to be done even before we can assume that we possess a full knowledge as to the number of species indigenous to the county.

The above remark must not be interpreted as expressing my desire for a bald list of names, which would possess about the same value, and convey the same amount of information, as an enumeration of the number and relative positions of the telegraph posts doing duty in the county at any given moment. Furthermore, records on the authority of 'Anon' cannot be accepted; therefore the fact should be grasped that reproducing the same is worse than useless, inasmuch as it entails expense without any adequate return.

On the other hand, a list of fungi, accompanied by notes, enumerating the substratum—or, in the case of parasites, the host on which the fungus is growing—is of value not only to local people but to mycologists in every part of the world, as bearing on the interesting problem of parasite and host, and other questions of scientific and economic importance. It is the ambition on the part of the members of the Mycological Committee of the Union to attempt and their hope to succeed in presenting an account of Yorkshire fungi on the lines indicated above, to the readers of this journal in the near future.

Fungi requiring organic food, either in a dead or living form, naturally follow in the wake of the so-called higher plants, whose privilege it mainly is to supply such food; hence, at first sight it might be imagined that the geographical distribution of fungi would mainly depend on that of the plants furnishing the required food, and such to a great extent, especially in the case of parasitic fungi, appears to be the fact. Nevertheless there are many curious anomalies relating to the distribution of fungi that are as yet unexplained. It is difficult to account for the absence in England of *Amanita cæsarea* Scop., a near ally of *Amanita muscaria* L., from which it differs in having yellow gills, and more especially

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in being edible, its qualities in this respect being such that an old author has described it as being food for the gods. This fungus occurs in France, Germany, in fact extends quite across Europe, and is also met with in North America and India, high up on the Himalayas. Numerous similar problems could be given relating to large species of fungi that could scarcely be overlooked.

Finally, most of all yet remains to be done in the important section of work dealing with the why and wherefore of the existence of fungi; the causes that led up to parasitism; tracing the genetic relationship between the various forms constituting an entity in the species of Uredineæ, etc. Much work bearing on these problems can be done best in the field, or at all events field work carefully and systematically carried out often suggests problems that are afterwards cleared up in the laboratory.

As a single example—a French mycologist had observed in the field that certain fungi were constantly eaten by slugs, whereas other equally abundant species were never eaten by mollusks. He further noted that in certain species it was always the stem that was eaten, whereas in others the pileus was the part constantly preferred. Further research revealed the fact that the presence of one or more forms of sugar was present in all the species eaten by slugs and snails, and that the location of these substances in the stem or pileus respectively determined the portion to be eaten.

The main object of this talk, which has been delayed thus far, is to intimate to members of the Union that a hitherto comparatively unworked field of research requires attention. I allude to Coprophilous, or dung-borne fungi.

Now it is just probable that there will be a feeling of repugnance at the idea of the very close contact with dung necessary for the detection of very minute fungi. This, however, is purely a matter of sentiment, and is soon waived aside when once the study is entered upon in real earnest.

Continental mycologists have been much more industrious than ourselves in prosecuting this special branch of study, and it may perhaps be as well to state that the little that is known of the occurrence of these minute organisms in this country has been done outside Yorkshire. This is not quite what one would wish, and it rests mainly with the members of the Union to reverse the statement.

That there is work to be done in this direction is proved by the fact that, due to the discovery of an interesting fungus on rabbit dung, collected in Mulgrave Woods during our last

Fungus Foray, the subject was followed up, and in addition to a careful examination of dung of different indigenous and domestic animals from different parts of Great Britain, the dung of many exotic animals—Lion, Hyæna, Bear, Kangaroo, Ostrich, Crocodile, etc., etc., was also examined, thanks to the kindness of Mr. Bartlett, Superintendent of the Zoological Gardens, Regent's Park.

The outcome of this work is, in the first place, the addition of about fifty species to the British Mycologic Flora; many of these were already known on the Continent, others, both genera and species, proved to be new to science.

Representatives of all families of fungi grow on dung, and a very interesting feature is the fact that in many instances the most primitive forms of the different groups occur on this substratum.

In the Agaricaceæ, or gill-bearing fungi, we meet with the most primitive types of the black-spored species of *Coprinus*, characterised by the deliquescent gills. Again, in the Ascomycetes, the primitive forms included in the order Gymnoascaceæ are by no means uncommon, and, although very minute, are in many instances very beautiful, the numerous asci or spore-containing cells being surrounded by a more or less loose mesh of threads, bearing outgrowths of fantastic forms, the use of which is at present problematical.

This habit of growing on dung is an acquired one, inasmuch as representatives of some of the families of fungi growing on dung at the present day existed long before the advent of warm-blooded, herbivorous animals, on the dung of which most fungi occur. According to statistics given elsewhere,* 708 species of fungi grow on the dung of herbivorous animals, 45 species on that of carnivorus animals, whereas only four species occur on the dung of reptilia. Seventy-four species of fungi are known to grow on rabbit dung.

One feature common to many coprophilous fungi is that the spores are provided with a certain amount of a transparent gelatinous substance adhering to their surface. This mucilage may appear under the form of tail-like appendages attached to one or both ends of the spore, or the entire surface of the spore may be covered with a thick layer of the same substance. The use of this peculiar mucilage is as follows:—In *Thelebolus stercorea* Tode, various species of *Ascobolus*, *Xylaria*, and others,

* 'Researches on Coprophilous Fungi,' Geo. Massee and E. S. Salmon; 'Annals of Botany,' 1891, p. 313, 3 plates.

the spores are ejected or shot out of the ascus to some distance when mature. Such spores often alight on blades of grass growing near the dung on which they are produced, and on coming into contact with the air the mucilage surrounding them almost immediately sets hard and is insoluble in water, hence the spores are not washed to the ground by rain, but remain firmly glued to the grass on which they alighted. Much of this spore-infected grass is eventually eaten by herbivorous animals, and in this way the spores find their way into the alimentary canal, where they commence to germinate, and after the dung is deposited produce fruit within a few days, shoot out their spores in due course, which are again swallowed along with the grass on which they alight, and thus herbivorous animals in every portion of the globe unconsciously assist in the distribution of these minute but beautiful organisms. Spores of coprophilous fungi found on dead grass that had remained throughout the winter lying on the ground were found to germinate readily after passing through the intestinal canal of a guinea-pig, and it is probably from such over-winter spores that the first crop of these fungi are produced in the spring. The large shipment of hay and forage of various kinds from one part of the world to another will in all probability assist in the distribution of coprophilous fungi; in fact, judging from the occurrence of many of our common British species in most of our colonies, it may fairly be assumed that this factor has already been at work.

NOTES on LINCOLNSHIRE LEPIDOPTERA.

***Calocampa exoleta* at Revesby, Linc. N.**—At the meeting of the Lincolnshire Naturalists' Union, on the 4th July last at Revesby, I found a large caterpillar feeding on the leaves of a Lily in the Abbey grounds, which went down to earth soon after. While in captivity it fed sometimes on the leaves of *Lilium speciosum*, and sometimes on those of the Oak. The moth came out on the 22nd of last month (September) and proved to be the above species.—F. M. BURTON, Highfield, Gainsborough, 7th October 1901.

Shark Moths near Gainsborough.—*Cucullia asteris.* This rare moth hatched out in my breeding cage about a year ago. I cannot say when I found the caterpillar, nor where I got it from. I was not familiar with it, and, consequently, though carelessly, lost sight of it.

Cucullia verbasci. For the last three seasons the caterpillar of this moth has occurred in great numbers, feeding on the various Mulleins (*Verbascum*) in my garden. When they first appeared they were far more numerous than they were this year, and probably by next season they will have vanished as suddenly as they came. I have never seen this moth before in this neighbourhood, though I have grown numbers of Mulleins of various kinds in my garden for years past.—F. M. BURTON, Highfield, Gainsborough, 7th October 1901.

FUNGUS FORAY AT CADEBY, MELTON, SPROTBOROUGH, AND WARMSWORTH.

CHARLES CROSSLAND, F.L.S.,

Halifax; Hon. Sec. Yorkshire Mycological Committee.

THE tenth annual gathering of the Yorkshire Mycological Committee consisted of a six days' Foray (21st-26th September) in the Cadeby, Melton, Sprotborough, and Warmsworth districts of South Yorkshire. These places lie on the high grounds partially overlooking the valley of the Don in the vicinity of Conisborough. The headquarters were fixed at the little farm-village of Cadeby, situate on the top of the hill, about a mile north of, and not easily accessible from, the ancient 'King's Stronghold.' Visitors had to run the gauntlet through a pit-yard and tunnel path, or cross a ferry below the castle, the hill being to climb in both cases. When once there, however, Cadeby formed a convenient centre from which to work the woods and parks for which permission to investigate had been obtained by the Hon. Secretaries of the Union, with the able assistance of Mr. M. H. Stiles and Mr. H. H. Corbett. These gentlemen had also secured a commodious house at the top of the village, containing large dining and work rooms, which afforded ample space for carrying on the indoor portion of the Foray.

The members of the Mycological Committee who took part in the investigations were Messrs. G. Massee, F.L.S., F.R.H.S., Royal Herbarium, Kew (President Mycological Committee); A. Clarke, Huddersfield; J. Williams Sutcliffe, Halifax; Thos. Gibbs, Sheffield; C. H. Broadhead, Thongsbridge; and the Secretary. There were also present Messrs. J. H. Holland, F.L.S., Royal Herbarium, Kew; Thos. Hey, Derby; and W. H. Cooke, Halifax. Several of the Committee were unable to attend. Mr. Thomas Birks, Eaglescliffe Junction, and Mr. W. N. Cheeseman, Selby, joined the general Excursion on the Thursday, when some interesting species were added to the list. The unavoidable absence of Mr. James Needham, Hebden Bridge, who on all occasions has proved himself to be a most indefatigable collector, particularly of micro-species, was specially regretted. Mr. Clarke and the writer visited the district the previous week-end so as to become more familiar with its bearings.

Considering the long-continued dry weather, the number of species collected was fairly satisfactory. The rains of the previous few days came just in time to waken up many of the smaller and more delicate kinds and give them a start: a heavy shower on the Monday afternoon tended in the same direction. The larger and more fleshy species could not respond so readily as the little ones. There was not a single *Amanita* found, not even *A. rubescens*; and only a solitary *Boletus* (*B. viscidus* L.) *Armillaria mellea* and *Pholiota mutabilis* are not so dependent on moist weather if the former can insinuate itself into the cambium layer of a living tree, and the latter lodge itself in a stout old stump. Of both these there were plenty in Potridings Wood, *Armillaria mellea* in an almost endless variety of forms.

The woods visited varied much in shade and moisture. Warmsworth was a failure. A naturally moist hollow in Potridings Wood, between the railway and Sprotborough Bridge, proved very prolific ground. The living trees were mostly Hazel and Elder, and made good shade. Several scattered heaps of dead boughs and branches, the remains of removed timber trees, were lying about; these were rich in fungi of many kinds. The beautiful *Poria sanguinolenta* literally covered one piece to the extent of 5 or 6 feet; one feature of interest connected with this cream white polypore is that it immediately becomes blood red in places where it is in the least bruised, or even touched. Thirteen of the sixteen *Mycenæ* met with were found here, *M. hæmatopoda, M. galopoda,* and *M. filopes* in quantity. *M. Berkeleyi* Mass. (=*M. excisa* Berk.) was here, but this fine well marked species, noted for the greatly extended sinus in the gills, was represented by only a couple of sporophores. Here also was the strong-smelling, white *Lepiota* (*L. Bucknalli* B.& Br.), which is anything but common; *L. cristata* in plenty; *L. Friesii* and *Chlorospora Eyrei* Mass. Mr. Massee writes:—

In point of rarity, and more especially from the geographical standpoint, perhaps the most interesting discovery made was that of *Chlorospora Eyrei* Mass. (= *Schulzeria Eyrei* Mass.), as being the only European representative of the section *Chlorosporæ* of the Agaricineæ, characterised by having distinctly green gills and spores. The headquarters of the Chlorosporæ is in the New World, where the species range from Brazil to the United States. *Chlorophyllum esculentum* Mass., an esculent fungus, having pea-green gills and spores, and a pileus 6-8 inches across, is not uncommon in British Guiana.

Chlorospora Eyrei was discovered some years ago in Hampshire by the Rev. W. L. W. Eyre, after whom it was named. It is a *Lepiota* looking fungus, having a whitish pileus about 1 inch across, and bluish-green gills, calling to mind the colour of the pileus of *Stropharia æruginosa*. The green colour of the spores, when collected on white paper, is quite as decided as that of the gills.

The discovery of a green-spored group of Agarics is of exceptional interest, as illustrating the extension of a biological feature in the evolution of the Agaricineæ, respecting the significance of which nothing is at present known.

As is well known, the large assemblage of Agarics is divided into five primary groups, depending on the colour of the spores, i.e., black, purple, brown, pink or salmon-colour, and white. In each of these colour-groups of Agarics there is an exact repetition of the same sequence of morphological details ; thus, in each group we find species furnished with a volva at the base of the stem, whereas others in each group are destitute of this structure. Some representatives of each group have the gills quite free from the stem, whereas in others the gills are grown to the stem, etc., etc. Consequently, but for the difference in the colour of the spores, and judged from a morphological standpoint only, representatives from the five colour-groups would be placed in one and the same genus, as was indeed done by Fries in his earlier works.

This point of interest, illustrated by the Chlorosporæ, is the fact that we find some genera included in the old colour-groups, showing a tendency to follow in the same line of becoming differentiated into colour-groups.

In the genus *Lepiota*, a member of the white-spored group, the structural features are free gills, and presence of a general and a secondary veil, forming, when fully expanded, a volva at the base of the stem, and a ring or annulus also on the stem. In the genus *Schulzeria*, a split-off from *Lepiota*, the ring is absent from the stem.

Now the two genera constituting the Chlorosporæ—*Chlorospora* and *Chlorophyllum*—agree morphologically with *Lepiota* and *Schulzeria*, differing only in the green gills and spores. Other members included in the old genus *Lepiota* have decidedly ochraceous spores. Other genera included in the old colour-groups, as *Pleurotus*, *Tricholoma*, etc., also show a decided tendency to vary the colour of their spores, while retaining their morphological features.

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There is a considerable amount of evidence in favour of the supposition that the most primitive section of Agarics, as *Coprinus,* etc., had dark-coloured spores, and that the sequence of evolution of the various colour-groups passed respectively from black, through purple, brown, and pink, to white. During this sequence of evolution certain other features of advantage were evolved as superior means of spore dispersion, protective features, etc.

Is it possible that, having secured the advantages mentioned, along with others, that a retrogression in favour of coloured spores, which may have some value when combined with the other advantages previously acquired, is in progress? It may be added that all the genera showing a tendency to form a new series of colour-sections of spores, belong to the most highly organised or white-spored section of Agarics.—G. M.

Some very striking object lessons illustrating plant diseases caused by fungi were observed in both Melton and Potridings Woods. In the former the Birch trees have suffered severely from the attacks of the Birch-tree Fungus (*Polyporus betulinus*), many of them being killed outright long before reaching their prime. Numerous great chunks of the fungus were to be seen which had been allowed to develop and propagate a new generation of disease. Certainly a dead Birch-trunk bearing several large specimens of this fungus is a most interesting object from an artistic point of view, a fact duly recognised by Mr. A. Clarke, who devoted considerable attention to these and other effective groups of fungi, illustrations of which will, in due time, supplement the already extensive and unique collection of stereophotographs of fungi possessed by this enthusiastic mycologist. In other places *Fomes annosus* Fr. (= *Trametes radiciperda* Hartig) was specially abundant, but will probably soon be rarer in the district, as the great majority of conifers are already infected; *Sequoia gigantea* was in one instance observed to be attacked by this fungus. The Larches were fairly free from the destructive Peziza *Dasyscypha calycina* = *P. Wilkomii.* One or two cups only were found on a fallen twig. Nearly all the Yew trees in the district were attacked by *Sphærella taxi* Cooke. Many trees had been killed by this parasite, which infests the leaves, others were more or less injured; some of those in the churchyard at Cadeby had been severely pruned back in the hope of getting rid of the unwelcome pest, but without avail. On careful examination the ascospores of *Sphærella taxi* prove to be 3-septate, hence the species must stand in future as

Sphærulina taxi (Cke.); in the genus *Sphærella*, as understood at the present day, the spores are 1-septate.

In a damp corner of Potridings Wood a large patch of Ground Ivy (*Glechoma hederacea*) illustrated very clearly the meaning of an epidemic caused by a parasitic fungus, nearly every leaf showing several chalk-white blotches caused by a minute mould—*Ramularia calcea* Cesati. Parasitic moulds, mainly *Erysiphe*, were very prevalent throughout the district. They were seen on *Arctium lappa*, *Polygonum aviculare*, *Acer*, *Circæa lutetiana*, *Heracleum sphondylium*, *Hypericum hirsutum*, *Trifolium repens*, *T. pratense*, and *Alchemilla vulgaris*. Some special moulds even attack other fungi, especially Agarics; every specimen of *Clitocybe fragrans* looked at was the host of *Sporodinia aspergillus* Schrœt. = *Syzygites megalocarpus* Cke.

Special attention was paid to host plants and habitats of fungi observed for the purpose of recording in the 'List of Yorkshire Fungi,' in course of preparation for publication.

In Melton Woods about a dozen specimens of *Tricholoma leucocephalum* were found growing clean through the flattened remains of a dead Hedgehog. They were exclusively confined to this small area, and were in all stages of development. Presumably this covering had favoured the germination of the spores in the ground beneath and helped on the formation of a succeeding generation of basidiophores.

Permission had been obtained to visit Edlington Woods, but so much attention was given to searching for micro-species that time was not available. Micro-material was found in sufficient quantity to keep four microscopes in full employ in its examination during the evenings and early mornings. Much of it required attending to with as little delay as possible.

Several novelties were found in a heap of decaying grass near Cadeby. One new to science = *Sphæroderma giganteum* Mass. & Crossl.; *Chætomium murorum* Wint.; and *Arachnomyces nitidus* Mass. & Salm. The latter species is the type of a new genus discovered at Kew by G. Massee and E. S. Salmon, some short time ago, the diagnosis of which is in the printers' hands at the present time.

The rabbits' dung wherever it was seen was plentifully pitted and decorated with numerous species of fungi of one kind or another, though very often *Stilbum fimetarium* monopolised the whole pellet. This dung yielded a fine specimen of *Poronia leporina* Ellis & Everhardt. This species is new to the European Flora, being previously only known from the United States,

where it occurs on the matrix mentioned above. A very distinct species characterised by the prominent scattered perithecia and the small spores.

Other species, new to Britain, are *Stilbum leiopus* Ehrh., discovered by Mr. Hey, on the dung of the wood-mouse, just within the boundary wall at the bottom of Scabba Wood, and *Helotium tumidulum* (Rehm) on fallen oak leaves, Conisborough Castle moat, by Mr. Gibbs.

These new finds at almost every Fungus Foray prove very plainly what an immense amount of work still remains undone in Britain. We ask ourselves the question: if a few new things can be brought to light at each pop-visit, what can be done by constant and persistent investigation the year round in suitable places? Fungi must abound, or 430 species could not have been found at Mulgrave Woods last year, in three or four days, within an area of much less than a square mile. The Royal Gardens, Kew, afford an example of continued work over a lengthened period. There, within an area of less than 300 acres, the Mycological Flora up to 1897 consisted of 337 genera and 1,340 species (Kew Bulletin, 1897, G. Massee). Allowing for a few introduced species, a good total remains. Again, the abstract of Mr. Massee's lecture on dung fungi shows what has been done in a single season in that direction. Persistent investigation is the method adopted by mycologists of other countries, and that accounts to a large extent for the great gaps we have in Britain in the sequence of genera and species of known fungi.

On the Monday evening, Mr. Massee gave a most instructive and interesting lecture on 'Coprophilous Fungi,' an abstract of which appears in this number. He also gave an extra one on 'Plant Diseases,' for the special benefit of one or two professional gardeners present. Each was illustrated by a fine series of drawings, strung on wires round the workroom.

Mr. Clarke's highly valuable series of stereo-photos were much admired.

Taken altogether, this has been one of the most successful and pleasant of Forays the Union has yet held. The weather was favourable for searching the woods if not for producing 'piles' of big fungi.

The business meeting was held on the Wednesday evening. Officers and Committee were re-elected, with the addition of Mr. C. H. Broadhead, Wooldale, Thongsbridge. It was decided to recommend Arncliffe Woods, near Whitby, for next year's Foray, to be held 27th September and following days.

In drawing up the list of species found, the arrangement of genera, as laid down by Professor Saccardo in his 'Tabulæ

Comparativæ Generum Fungorum Omnium' has been followed. With a view to make it of more scientific value, the host or habitat of each species is given.

The finds for each locality have been kept separate. The abbreviations of names of localities are :—C. = Cadeby ; M. = Melton Woods ; W. = Warmsworth ; P. = Potridings Wood, near Sprotborough ; S. = Sprotborough.

BASIDIOMYCETÆ.

(*GASTROMYCETÆ.*)

NIDULARIACEÆ.

Cyathus Haller.

C. vernicosus DC. C., M.
On road-scraping heaps.

Crucibulum Tul.

C. vulgare Tul. C., M., P.
On fallen branches.

Sphærobolus Tode.

S. stellatus Tode. C., M., W., P.
On rotten wood in moist places.

LYCOPERDIACEÆ.

Lycoperdon Tournf.

L. gemmatum Batsch. M., W.
On the ground.

L. pyriforme Schæff. C., M., W., P., S.
On the ground and on rotten wood.

Bovista Dill.

B. nigrescens Vitt. P.
In pasture.

PHALLACEÆ.

Ithyphallus Fr.

I. impudicus Linn. M., P.
On the ground.

Mutinus Fr.

M. caninus Fr. W.
On soil-and-moss-covered tree stump.

(*HYMENOMYCETÆ.*)

AGARICACEÆ.

Agariceæ.

Chlorospora Mass.

C. Eyrei Mass.
= Schulzeria Eyrei Mass. P.
On the ground among decaying twigs.

Lepiota Fries.

L. procera Scop. C.
In field.

L. Friesii Lasch. P.
On ground in woods.

L. hispida Fr. P.
On the ground in woods.

L. cristata A. & S. M., P.
Among grass, margin of wood.

L. excoriata Schff. S.
On the ground.

L. Bucknalli B. & Br. P.
On the ground among decaying twigs.

Armillaria Fries.

A. mellea Fl. Dan. C., M., W., P.
In clusters about stumps and the base of living tree trunks; also solitary and scattered.

Tricholoma Fries.

T. rutilans Schff. M.
On the ground among rotten branches in a mixed wood.

T. terreum Schff. M.
On the ground.

T. carneum Bull. C.
In pasture.

T. leucephalum Fr. M.
Growing through the flattened remains of a dead Hedgehog.

T. personatum Fr. C.
In pasture.

T. nudum Bull. P.
On the ground.

T. melaleucum Pers.
var. porphyroleucum Fr. P.
On ground in the wood.

Clitocybe Fries.

C. fragrans Sow. P.
On the ground in wood. Every basidiophore seen was attacked by the parasitic mold Sporodinia aspergillus.

Laccaria B.&Br.
L. laccata B.&Br. M.
On the ground in wood.
Collybia Fries.
C. radicata Fr. P.
About old stumps, penetrating deeply by a tough, gradually tapering root.
C. maculata A.&S. C., M., P.
Among grass in woods.
C. butyracea Bull. M., P.
Among grass and dead leaves.
C. velutipes Curt. S.
On trunk.
C. confluens Pers. P.
On soil among dead leaves.
C. tuberosa Bull. M., P.
In woods, on the ground among decaying twigs, etc.
C. nummularia Fr. M., P.
Among decaying grass and leaves.
C. acervata Fr. M.
On fallen pine-log.
C. dryophila Bull. M.
Among decaying leaves.
C. ambusta Fr. C.
On scorched ground among the charred remains of burnt branches.
Mycena Fries.
M. pura Pers. P.
On ground, margin of wood.
M. Berkeleyi Mass. P.
On rotting branches.
M. rugosa Fr. P.
On stump.
M. galericulata Scop. C., M., W., P.
On stumps.
Var. calopoda Fr. P.
M. polygramma Bull. M.
Near stump.
M. ammoniaca Fr. P.
On the ground among rotting wood.
M. filopes Bull. M., P.
Among decaying leaves.
M. acicula Schff. M., P.
On rotten wood.
M. hæmatopoda Fr. M., P.
On decaying branches.
M. sanguinolenta A.&S. C., M., P.
On the ground among dead leaves, etc.
M. galopoda Fr. C., M., W., P.
In woods, on the ground.
M. vulgaris Pers. M.
On and about rotten twigs.
M. discopoda Lév. M.
On dead twigs.
M. setosa Sow. P.
Among fragments of dead leaves.
M. capillaris Schm. P.
On dead beech leaves.
Omphalia Fries.
O. picta Fr. P.
On decaying twigs.
O. grisea Fr. M.
On the ground in wood.
O. integrella Pers. P.
Pleurotus Fries.
P. ulmarius Bull. C.
On fallen trunk.
P. pantoleucus Fr. P.
On fallen bough.
P. mitis Pers. M.
On bark.
P. septicus Fr. C.
On dead branch.
Pluteus Fries.
P. cervinus Schff. C., M., W., P., S.
About old stumps.
P. chrysophæus Schff. P.
On dead wood.
P. phlebophorus Dittm. P.
On decaying stump.
Nolanea Fries.
N. pascua F. S.
In meadows.
Eccilia Fries.
E. atro-puncta Pers. P.
On the ground in woods.
Pholiota Fries.
P. ombrophila Fr. M.
P. togularis Bull. C.
On the ground.
P. squarrosa Müll. M.
On stump.
P. mutabilis Schff. P.
In great clusters about old stumps.
Inocybe Fries.
I. dulcamara A.&S. P.
In mixed woods.
I. echinata Roth. P.
In mixed woods.

Inocybe asterospora Quelet. M.
On the ground.
I. geophylla Sow. P.
On the ground.
Flammula Fries.
F. carbonaria Fr. C.
On charred stump.
F. sapinea Fr. M.
On heathy ground.
Galera Fries.
G. tener Schff. C., M., W., P., S.
On the ground.
G. spartea Fr. C.
In meadow.
G. hypnorum Batsch. M.
Among moss.
Tubaria Fries.
T. furfuracea Pers. C., M., P.
On the ground in woods.
Cortinarius Fries.
C. pennicillatus Fr. P.
Agaricus Linn.
A. arvensis Schff.
Common.
A. campestris L.
Common in almost all the fields.
A. hæmorrhoidarius Kalch. S.
In park.
A. sagatus Fr. P.
In wood.
Stropharia Fries.
S. æruginosa Curt. M.
In moist shady place in the wood.
S. stercoraria Fr. C.
On cow dung in pasture.
S. semiglobata Batsch.
Common on cow and horse dung in pastures.
Hypholoma Fries.
H. sublateritium Schff. M., P.
On stumps.
H. fasciculare Huds. C., M., W., P.
On stumps.
Var. elæodes Bull. C.
Panæolus Fries.
P. phalænearum Fr. S.
On dung in pasture.
P. campanulatus L. S.
On dung in park.
Anellaria Karst.
A. separata L. S.
On dung in pastures.

Psilocybe Fries.
P. semilanceata S.
In pasture.
P. spadiceo-grisea Schff. M.
Near decaying stump.
P. fœnisecii Pers. C., S.
In pasture.
Psathyra Fries.
P. conopilea Fr. M., P.
On the ground, margin of wood.
P. pennata Fries. P.
On rich soil.
Psathyrella Fries.
P. gracilis Fr. C., M., P., S.
Grassy places in the woods.
P. disseminata Pers. C., M., W.
In thousands, covering old stumps.
P. atomata Fr. C.
Among grass in wood.
Coprinus Fries.
C. comatus Fr. C.
By road side.
C. atramentarius Fr. C., M., P., S.
On the ground in woods, and moist open places.
C. niveus Pers. C.
On rich, loose soil.
C. micaceus Bull. C., M., W., P., S.
On decaying stumps.
C. lagopus Fr. C.
On rich, loose soil.
C. radiatus Bolt. C., M., P.
On horse dung.
C. sociatus Fr. C., M.
Among grass.
C. plicatilis Curt. C., M., W., P.
In pastures.

Paxilleæ.

Hygrophorus Fr.
H. conicus Scop. S.
In pastures.
H. psittacinus Schff. S.
In pastures.
Paxillus Fr.
P. involutus batsch. M., P.

Lactarieæ.

Lactarius Fries.
L. torminosus Schff. M.
L. turpis Weinm. M.
L. pyrogalus Bull. P.
L. pallidus Pers. P.

L. glyciosmus Fr. P.
L. subdulcis Bull. M.
All on the ground in the woods.
Russula Fries.
R. adusta Pers. M.
R. delica Fr. M.
R. cyanoxantha Schff. M.
R. granulosa Cooke. M.
R. fragilis Fr. M.
R. ochroleuca Pers. M.
All on the ground in and near the woods.

Marasmieæ.

Marasmius Fries.
M. peronatus Bolt. P.
Among dead leaves.
M. oreades Bolt. C., M., W., P., S.
In rings in the pastures.
M. erythropus Fr. P.
On the ground in wood.
M. ramealis Bull. M., P.
On twigs.
M. rotula Scop. C., M., W., P.
On twigs.
M. androsaceus L. C., M., P.
On leaves, etc.
Panus Fries.
P. torulosus Fr. M.
On tree trunk.
P. stypticus Bull. M.
On fallen trunk.

POLYPORACEÆ.

Boleteæ.

Boletus Dill.
B. viscidus L. M.
On the ground.
Fistulina Bull.
F. hepatica Fr. C.
On oak stump.

Polyporeæ.

Polyporus Mich.
P. squamosus Fr. C., M., W.
On Ulmus montana at Melton.
P. giganteus Fr. M.
On stump.
P. sulphureus Fr. M., W.
On Yew at Warmsworth.
P. alligatus Fr. P.
On fallen trunk.
P. betulinus Fr. C., M.
P. mollis Fr. P.
On fallen boughs.
P. chioneus Fr. M., P.
On fallen boughs.
P. armeniacus Berk. P.
Polystictus Fr.
P. versicolor Fr. C., M., W., P., S.
On stumps.
P. hirsutus Fr. M., P.
On stumps.
Fomes Fries.
F. ulmarius Fr. M., P.
F. igniarius Fr. C., M.
Both on fallen wood.
F. annosus Fr. M.
Parasitic on conifers.
F. ferruginosus Fr. M.
On fallen wood.
Poria Fries.
P. vaporaria Fr. M., W., P.
P. blepharistoma B.&Br. M., P.
P. obducens Pers. P.
P. sanguinolenta A.&S. P.
All on fallen wood.
Dædalea Fries.
D. latissima Fr. P.
On dead branch.

HYDNACEÆ.

Hydnum L.
H. alutaceum Fr. P.
H. viride Fr. P.
H. nodulosum Fr. P.
H. niveum Pers. P.
Grandinia Fr.
G. granulosa Fr. M., P.
Odontia Pers.
O. fimbriata Pers. P.
All on fallen wood.

CLAVARIACEÆ.

Clavaria Vaill.
C. cristata Holmsk. M.
On the ground.
C. rugosa Bull. M.
On the ground.
C. abietina Schum. M.
On pine leaves.
Pistillaria Fries.
P. puberula Berk. W.
On decaying leaves.

THELEPHORACEÆ.

Stereum Pers.
S. hirsutum Fr. C., M., W., P., S.
S. sanguinolentum Fr. M.
S. rugosum Fr. M., P.
S. spadiceum Fr. M., P.
All on fallen wood.
Corticium Fr.
C. porosum B.&Curt. M.
C. calceum Fr. P.
C. arachnoideum Berk. M.
On fallen branches.
C. sambuci Fr. P.
On dead Elder.
C. comedens Fr. P.
On living Hazel.
Peniophora Cooke.
P. ochracea Mass. M.
P. cinerea Cke. M., P.
On dead branches.
Soppittiella Mass.
S. sebacea M. P.
Encrusting twigs, grass, etc.
Cyphella Fries.
C. albo-violescens Karst. P.
On chips.
Thelephora Pers.
T. laciniata Pers. M.
On the ground.

TREMELLACEÆ.

Auricularieæ.

Hirneola Fries.
H. auricula-judæ Berk. C., M., P.
On living Elder branches.

Tremelleæ.

Exidia Fries.
E. albida Brefeld. M., P.
On branches.

Dacryomyceteæ.

Dacryomyces Nees.
D. deliquescens Duby.
Common. C., M., P., S.
D. stillatus Nees. M., P.
On worked wood: rails, etc.

Protoclavarieæ.

Calocera Fries.
C. viscosa Fr. M., P.

C. cornea Fr. C., M., P., W.
C. stricta Fr. M.
All on decayed decorticated wood.

UREDINACEÆ.

Puccineæ.

Uromyces Link.
U. polygoni (Pers.). C.
On Polygonum aviculare.
Puccinia Pers.
P. menthæ Pers. M.
On Mentha arvensis.
P. suaveolens (Pers.). P.
On Carduus arvensis.
P. malvacearum Mont. S.
On Malva.

USTILAGINACEÆ.

Ustilago Pers.
U. violacea (Pers.). C.
On anthers of Lychnis diurna.

Tilletieæ.

Urocystis Rabh.
U. anemones (Pers.). P.
On leaves of Ranunculus repens.

ASCOMYCETÆ.
(PYRENOMYCETÆ.)

PERISPORACEÆ.

Erysipheæ.

Sphærotheca Lév.
S. humuli (DC.) Bun. P.
On Alchemilla vulgaris.
S. pannosa (Wallr.) Lév. M., P.
On Rosa.
Erysiphe Hedw.
E. polygoni DC.
On Anthriscus sylvestris. W., P.
Circæa lutetiana. P.
Hypericum hirsutum. M., P.
Trifolium repens. C., M.
T. arvense. P., W.
E. taurica Lév. C., M., P., W.
On Arctium Lappa.

Eurotieæ.

Arachnomyces Massee&Salmon.
A. nitidus M.&S. C.
On decaying grass.

SPHÆRIACEÆ.

Sphærelleæ.

Sphærella C.&DN.
S. rumicis Desm. C., M., W.
On Rumex acetosa.
Sphærulina Sacc.
S. taxi (Cke.). C., M.
On living Yew leaves.

Sphærieæ.

Chætomium Kunze.
C. murorum Wint. C.
On decaying grass.
Lasiosphæria C.&DN.
L. spermoides C.&D. M., P.
L. ovina Pers. C., M., W., P.
Melanomma Nitts. Fckl.
M. pulvis-pyrius (Pers.). M.
Chætosphæria Tul.
C. callimorpha (Mont.). M.
The preceding four on dead branches.

Sordarieæ.

Sordaria C.&DN.
S. decipiens Wint. M.
S. setosa Wint. C.
S. minuta Fckl. C.
On Rabbit dung.
Sporormia DeNot.
S. intermedia. C.
S. minima. C.
On Rabbit dung.

Cucurbitarieæ.

Cucurbitaria Gray.
C. elongata Grev. C., M.
On Rosa stems.

XYLARIACEÆ.

Hypoxylon Bull.
H. rubiginosum F. M.
On wood.
Daldinia C.&DN.
D. concentrica (Bolton). P.
On wood.
Poronia Willd.
P. leporina Ellis&Everh. C.
On rabbit dung.
Xylaria Hill.
X. polymorpha Grev. P.
On decaying stump.
X. hypoxylon Linn.
Extremely common on dead wood.

VALSACEÆ.

Eutypa Tul.
E. lata Tul. C., M., P.

HYPOCREACEÆ.

Sphæroderma Fckl.
S. giganteum Massee&Crossland. C.
On decaying grass.
Nectria Fr.
N. cinnabarina Fries. M., W., P.
Calonectria DeNot.
C. funicola B.&Br. C.
Hypocrea Fries.
H. rufa Fr. C., W.
All on dead branches.
Hypomyces Fries.
H. rosellus Tul. M.
H. ochracea Tul.
Both on Polyporus betulinus. M.

HYSTERIACEÆ.

Dichæna Fr.
D. quercina (Pers.). M., P.
On dead Oak wood.
Hysterium Tode.
H. virgultorum DC. C.

(DISCOMYCETÆ.)

PEZIZACEÆ.

Humaria Fries.
H. melaloma (Fckl.) Mass. C.
On charred ground.
H. granulosa (Bull.) Sacc. M., W.
On cow dung.
H. hepatica Sacc. P.
Among moss and hepatics on old stump.
Lachnea Fries.
L. scutellata (L.) Gill.
On dead wood.
Helotium Fries.
H. ferrugineum (Schm.) Fr. M., S.
H. pallescens Fr. P.
H. lutescens (Hedw.) Fr. M.
H. salicellum Fr. M.
H. virgultorum (Vahl.) Karst. P., S.
All on decayed branches.

H. cyathoideum (Bull.) Karst.
C., M., P.
On decaying herb stem.
H. renisporum Ellis. P.
On petioles and veins of dead oak leaves.
H. tumidulum (Rehm).
On under side of decaying oak leaves, Conisborough.
H. fagineum (Pers.) Fr.
On beech mast.
Cyathicula DeNot.
C. coronata Bull. M.
On decaying herb stem.
Chlorosplenium Fries.
C. æruginosum Œd. M., P.
On dead branches.
Mollisia Fr.
M. atrata (Pers.) Karst. C., M.
M. cinerea (Batsch.) Karst.
C., M., W.
M. melaleuca (Fr.) Sacc. P.
On chips and branches.
Dasyscypha Fries.
D. virginea (Batsch.) Fckl. M., P.
D. nivea (Hedw.) Mass. M., P.
D. calycina (Schum.) Fckl. M.
On fallen larch branch.
Belonidium M.&D.
B. pruinosum (Jerd.) Mass. P.
On Eutypa lata.

ASCOBOLACEÆ.

Ascophanus Boud.
A. carneus Pers. M., P.
A. equinus (Müll.) Mass.
C., M., W., P.
A. ochraceus Crouan. C.
All on both cow and horse dung.
Ascobolus Pers.
A. vinosus Berk. C.
On rabbit dung.
A. glaber Pers. P.
A. furfuraceus Pers. C., M., W., P.
A. immersus Pers. C., M.
Last three on cow dung.
Saccobolus Boud.
S. neglectus Boud. C.
On rabbit dung.

BULGARIACEÆ.

Coryne Tul.
C. sarcoides (Jacq.). M., P.

Orbilia Fries.
O. leucostigma Fr. P.
Both on wood.

PHACIDIACEÆ.

Trochila Fries.
T. ilicis (Fr.) Crouan. M., C., P.
On dead Holly leaves.
Rhytisma Fr.
R. acerinum Pers. M.
On Sycamore leaves.

GYMNOASCACEÆ.

Arachniotus Schrœt.
A. ruber Sch. C.
On rabbit dung.

PHYCOMYCETÆ.

MUCORACEÆ.

Mucoreæ.

Mucor Mich.
M. mucedo L. C., M.
On dung.
Spinellus V.Teigh.
S. fusiger V.T. C., M.
On agarics.
Sporodinia Schrœt.
S. aspergillus Schrœt. C., M., P.
On living agarics.
Pilaira V.Teigh.
P. anomala Schr. C.
On rabbit dung.
Pilobolus Tode.
P. crystallinus Tode.
Common on cow dung.

Chætocladieæ.

Chætocladium Fries.
C. Jonesii Fr. C.
On rabbit dung.

Piptocephalideæ.

Piptocephalus DeBary.
P. repens DB. C., M.
On Rabbit dung.

Cystopodaceæ.

Cystopus Lév.
C. candidus Lév. M., P.
On Capsella.

MYXOMYCETÆ.

Physarum Pers.
P. leucophæum Fr. P.
Stemonites Gled.
S. fusca Roth. M., P.
S. typhina Roth. P.
S. Friesiana DeBary. M., P.
Reticularia Bull.
R. lycoperdon Bull. P.
Trichia Hall.
T. varia Rost. P.
Arcyria Hill.
A. punicea Pers. P.
A. incarnata (Pers.) Rost. P.
Lycogala Mich.
L. epidendron (Bux.) Rest. P.

DEUTEROMYCETÆ.

SPHÆRIOIDACEÆ.

Phyllostictus Pers.
P. primulicola Desm. M.
On leaves of Primula vulgaris.
Phoma Fries.
P. nebularis Berk. C.
Asteroma DC.
A. rosæ DC. C.
On garden rose.
Vermicularia Ehrh.
V. trichella Grev. C.
On dead ivy leaves.

HYPHOMYCETÆ.

MUCEDINACEÆ.

Fusidium Link.
F. griseum Link. P.
On dry oak leaves.
Cylindrium Bon.
C. flavo-virens Bon. M.
On fallen oak leaves.
Rhopalomyces Corda.
R. candidus B.&Br. P.
Botryosporium Corda.
B. pulchrum C. M.
On decaying herb stem.
Cephalosporium Corda.
C. acrimonium C. C.
On dead stem of Heracleum.
Penicillium Link.
P. glaucum Link. C.
On decaying Fistulina.
P. candidum Link. M.
Botrytis Mich.
B. vulgaris Fr. C., M., W.
Common on herb stems.
Sepedonium Link.
S. chrysospermum. M., W.
Diplosporium Bon.
D. album Bon. C.
On decaying herb stem.
Diplocladium Bon.
D. macrosporium (Fr.) Mass. M.
Trichothecium Link.
T. roseum Link. P.
On twigs.
Ramularia Unger.
R. calcea Cer. P.
On ground-ivy.

DEMATIACEÆ.

Torula Pers.
T. monilioides Corda. P.
On dead branches.
T. herbarum Link.
On dead Heracleum stem.
Echinobotryum Corda.
E. atrum Corda.
Parasitic on Pilaira on rabbit dung.
Trichosporium Fries.
T. fuscum Sacc. P.

STILBACEÆ.

Stilbum Tode.
S. tomentosum Schr. M.
Parasitic on Trichia.
S. erythrocephalum Dittm. M.
On wood-pigeon dung.
S. fimetarium B.&Br.
Extremely common on rabbit dung.
S. leiopus Ehrh.
On wood-mouse dung.
Scabba Wood.
S. melleum B.&Br. P.
On wood.
Sporocybe Sacc. M.
S. Phillipsii B.&L.

TUBERCULARIACEÆ.

Ægerita Pers.
Æ. candida P. P.
Volutella Tode.
V. ciliata (Fr.). M.

NOTE on LINCOLNSHIRE FUNGI.

Some Fungi at Woodhall Spa, Lincs.—During a visit to Woodhall Spa, Div. 10, in October, I noticed a great variety of Fungi growing in the Pine and Birch Woods, near the Bath House; I sent a few of the most noticeable to the Rev. W. Fowler, who very kindly named for me the first twenty species in the following list:—

Amanitopsis vaginata, Amanita rubescens, and *A. muscaria*; this last abundant in the Birch Woods, its scarlet pileus making quite a glow of colour.

Boletus bovinus, B. chrysenteron, B. subtomentosus, B. edulis, B. scaber, and *B. luridus,* all abundant.

Collybia maculata and *C. dryophilus.*

Calocera viscosa, abundant in the Pine Woods.

Lactarius turpis, L. quietus, and *L. fuliginosus.*

Paxillus involutus.

Pholiota squarrosa, growing at the base of an ash tree.

Russula alutacea, R. furcata, and *R. ochroleuca.*

Coprinus atramentarius and *C. comatus.*

Cyathus vernicosus.

Hypholoma fascicularis, common on old stumps.

Marasmius oreades, frequent in the pastures.

Psalliota campestris, the same.

Tricholoma personatus.

Xylaria hypoxylon, frequent on old stumps.

These are only a very few of the species I saw there; several days' rain rather made work with them, so that I did not gather as many as I hoped to have done.—S. C. Stow, Court Leys, Brandon, Grantham, 24th Oct. 1901.

BOOK NOTICE.

Scharff's History of the European Fauna.—The History of the | European Fauna | By | R. F. Scharff, B.Sc., Ph.D., F.Z.S. | . . | . . | . . | . . | With illustrations. | London | Walter Scott, Limited | Paternoster Square | 1899 [8vo. cloth, 364 + viii. pages + advertisements.

We are pleased to be able to unhesitatingly commend this little work as an able and interesting exposition of the views still generally held as to the evolution of the European fauna and flora.

We may select for special remark and approval the dissertation upon the Glacial period, in the course of which is set forth an array of facts and cogent reasons for the probability that the severity of the cold during the Ice age has been unduly exaggerated, and that the climate at that period need not have been widely different from that we at present enjoy to produce all the phenomena of that time.

The aqueous origin of much of the Boulder Clay is successfully advocated by the author, who gives many facts and cites many honoured names in support of his contention.

Dr. Scharff recognises five chief centres of creation from which the European fauna and flora have been derived, which, arranged in the order of their appearance, may be known as Lusitanian, Alpine, Oriental, Arctic, and Siberian, and each of which is considered to have appreciably affected the general character of European life.

We, however, entirely disagree with the author's doctrine of the plurality of life's fountains, and also dissent from the unsatisfactory basis upon which they have been established, and, while freely acknowledging the brilliant acumen and deep research of the learned author, believe that all the phenomena as epitomised in the diagram at p. 117 may be more logically explained by evolution within or near the Germanic area from whence the improved and more dominant types have gradually spread, driving further and further afield the earlier and weaker forms.

The work, however, in its entirety is one that can heartily be commended to our readers, not only for the wealth of facts attractively set forth, but for the general erudition and literary excellence for which the doctor is noted.

NOTES on YORKSHIRE BIRDS.

Occurrences of Uncommon Migrant Birds at Spurn.—A fine Bluethroat (*Cyanecula suecica?*), a male, I should think, was seen here on the 10th of September. A nice lot of Siskins (*Chrysomitris spinus*) were seen about here on the 14th September, and a ♂ Great Spotted Woodpecker (*Dendrocopus major*) on 25th September. A Common Buzzard (*Buteo buteo*) was shot near Easington on the 23rd of September, and a Short-eared Owl (*Asio brachyotus*) on 20th September.—PHILIP W. LOTEN, Easington, 12th October 1901.

Kingfisher Breeding at Huddersfield.—Two pairs of Kingfishers (*Alcedo ispida*) have bred (the nests being known) in this immediate district during the past season, and probably others also nested in the district. In one case the nest was disturbed just as the young were fully feathered, but as they all flew out of the nest, it may reasonably be hoped they were none the worse for their premature dispersal from home. The species has again several times visited the ponds in my own grounds this year, and on one occasion two were seen there together.—GEO. T. PORRITT, Crosland Hall, near Huddersfield, 19th September 1901.

'Curious Site for a Thrush's Nest' at Netherton Station.—It is, I think, worth placing on record that the pair of Thrushes (or presumably the same pair) which built their nest and reared their young in such a curious place at Netherton Railway Station, near Huddersfield, in 1900 (see 'Naturalist,' 1900, pp. 164 and 240), returned to exactly the same spot in the spring of this year. On 1st April I noticed them busy building their nest, and by the 10th they were sitting keenly on their eggs, taking no notice either of the trains or numerous passengers, with all the attendant noise and commotion; nor at night of the bright light from the large lamp close beside them. Thanks to the protection afforded by the station master and his assistants, I believe the young again all got safely away; but the parent Thrushes did not—as I rather expected they would—rear their second brood on the same site.—GEO. T. PORRITT, Crosland Hall, Netherton, Huddersfield, 25th October 1901.

Green Woodpecker Nesting in Harewood Park.—I was fortunate in meeting with the above bird in Harewood Park on the 8th of June this year. My attention was arrested by seeing some new chippings at the foot of a large Ash tree, and while examining them a further shower came down. On looking up I discovered a hole fully 50 feet up, and, on casting a stone, out flew a bird about the size of a Jay, which I had no difficulty in identifying as a Green Woodpecker (*Gecinus viridis*). It soon confirmed this by uttering its peculiar laughing cry, which strongly resembled the laugh of a hysterical female. This it repeated on several occasions and came back several times while I was in the vicinity. I paid a visit two weeks later with my climbers and a rope, and, although I got partly up the tree, the bend was at such an angle that I had to give up the attempt to reach the nest, much as I should have liked to see it.—THOS. RAINE, Woodland View, Chapel-Allerton, 25th September 1901.

NOTES and NEWS.

We understand from Mr. H. Wallis Kew that since the publication of his paper on 'Lincolnshire Pseudoscorpions: with an Account of the Association of such Animals with other Arthropods,' in the July 'Naturalist,' he has received several items of additional information, and that he is engaged upon a supplementary paper, which will be offered to this journal in due time. We hope those of our readers who have seen Chelifers on Flies' legs, or other similar associations, will communicate their observations to Mr. Kew, who may be addressed at 157, Fermé Park Road, Hornsey, London, N.

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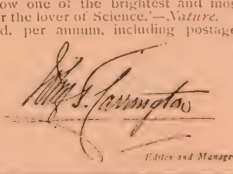

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Spiders of Northumberland and Durham.—Rev. J. E. Hull.
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Ramble in Search of *Clausilia rolphii*.—C. S. Carter, M.C.S.
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Yorksh. Geol. and Polyt. Soc.—Proc., Vol. 14, Part 2, publ. Oct. 1901. [The Society.
Természetrajzi Füzetek, Vol. 24, 1901, Partes 3-4, 20th Oct. 1901. [Hung. Nat. Mus.
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Duplicate Lepidoptera.—*Hesperia lineola*, from Essex. Wanted, local Butterflies.—W. R. HAYWARD, Sawbridgeworth, Herts.

Fossil Mollusca from Eocene and Oligocene, Paris Basin. Suites of these interesting Fossils, boxed, named, and localised, 40 varieties, by parcels post, on receipt of postal order for 6s. 6d.—Address R. CHARLES, Naturalist, Highcliffe-on-Sea, Christchurch, Hants.

Flora of West Lancashire: Silverdale Area.—I have tried to buy and I have tried to borrow the undermentioned issues without success. Will someone (if unable or unwilling to lend) extract for me the West Lancashire items relating to Silverdale? A list has been on the stocks for some years and only waiting for this information to complete the bibliography. Watson Bot. Exch. Club, Nos. 1, 2, 4, 5, 7, 8, 10, 12 to date; Rep. Bot. Exch. Club, 1867 and earlier, 1869, 1877-8-9, 1881, 1890, 1896 to date.—S. L. PETTY, Ulverston.

For Sale or Exchange: Tempere's Diatomees du Monde Entier. A collection of 625 Slides, each described in printed Catalogue. Very scarce. Cost £25. —F. W. MILLS, Thornleigh, Huddersfield.

SCIENCE IN HULL.

Transactions | of the | Hull Scientific and | Field Naturalists' Club | for the year 1900. | Vol. I. No. III. | Edited by | **Thomas Sheppard,** F.G.S., and **J. R. Boyle,** F.S.A. | — | Price Two Shillings Net. | — | Sold by A. Brown & Sons, Ltd., Savile Street, Hull. | — | November 1, 1900.

Pressure upon the space of the 'Naturalist' has been the sole reason why our notice of this admirable local publication has been delayed, but none the less have we to congratulate our Hull friends upon the success with which they carry on their work, and particularly upon the fact that they know—and adhere to—the proper function of a local natural history and

Ashby Decoy: inside the N.E. Pipe.

scientific society. There is not a paper in this publication of 156 pages and nine plates which does not refer strictly to the district worked by the members.

The first paper, illustrated by plates, one being of the quaint model of an ancient boat and its warrior crew, is by Mr. Secretary Sheppard, on 'Prehistoric Man in Holderness.' This is followed by a list of additions to the East Riding Moss Flora, by Mr. J. J. Marshall. Next comes an excellent account by Mr. T. Audas, L.D.S., of the 'Old Wild Duck Decoys of Lincolnshire and the East Riding of Yorkshire,' illustrated by a couple of views of the one at Ashby, Lincolnshire, and two views and a plan of the one at Meaux, Yorkshire. We reproduce by leave the former two.

Mr. T. Petch, B.Sc., B.A., has some 'Notes on the Distribution of Land and Fresh Water Mollusca in Holderness.' A portrait and interesting biographical sketch follows of one of the ablest all-round naturalists Hull ever produced, George Norman, who flourished 1823-1882. Mr. J. W. Boult follows with 'Additions to the Club's List of Local Macro-Lepidoptera, 1900,' after which we have Mr. J. F. Robinson with his 'East Riding Botanical Notes, 1900,' Mr. R. H. Philip on 'Deformed Diatoms in the Subway near the St. Andrew's Dock, Hull,' various 'Local Archæological Notes' by Mr. Thos.

Ashby Decoy: looking into the Pipe.

Sheppard, F.G.S., a paper on 'A Haltemprice Document' by Mr. J. R. Boyle, F.S.A., a 'List of the Coleoptera occurring around Hull,' by Mr. C. W. Russell, some 'Notes on the History of the Driffield Museum of Antiquities and Geological Specimens' by Mr. J. R. Mortimer, and the first part of a paper on 'Recent Foraminifera of the River Humber' by Mr. F. W. Mills, F.R.M.S., while the Secretary's 'Notes on the Progress made by the Club in 1899-1900' brings a most valuable local publication to a close.

Many congratulations to the Hull naturalists, their club, and their able and indefatigable Secretary, and best wishes for their prosperity, will fitly end our notice of their latest work.

Naturalist.

NOTES on MOLLUSCA.

***Helix aspersa* var. *exalbida* at Hubbard's Hill, Louth.**—On Saturday, 31st August, I found a living example of *H. aspersa* v. *exalbida* on the grassy slope of Hubbard's Hill, near the road. On the following Friday I found a specimen in the wood approaching v. *exalbida*. There was a faint colouring on the inside of the shell, and the animal was rather dark grey. The animal in the other case was yellowish. This, together with a specimen of *Helix nemoralis* v. *albina*, which I found in the wood in June, are additions to my list of 'Albinism in Mollusca at Hubbard's Hills,' Nat., May 1901, p. 157.—C. S. CARTER, Hon. Curator Louth Ant. and Nat. Soc., 172, Eastgate, Louth, Lincs., 10th September 1901.

Note on Breeding *Limnæa peregra* monst. *sinistrorsum*.—During May of the present year, being in possession of a few living specimens of the reversed form of *Limnæa peregra* (see my note in 'Naturalist,' July 1901, p. 216), I thought it might be interesting to keep them alive, at any rate until they spawned, to ascertain to what extent (if any) the laws of heredity played a part in the reproduction of these malformations. Of course the experiment was very incomplete, as I have no evidence that the other parent was sinistral or dextral. The one thing I am clear about is that all the spawn in my aquarium was deposited by the reversed or sinistral form, so that undoubtedly one parent was malformed. In due time the spawn was hatched, the dextral and sinistral being mixed from the same egg masses, the latter being extremely scarce in comparison with the former.—WM. NELSON, Crossgates, 24th August 1901.

Habits of the Fry of *Limnæa stagnalis*.—Keeping an aquarium for the purpose of rearing and observing the fry of different species of Limnæidæ, I have furnished it with various aquatic plants, amongst which is the Frogbit (*Hydrocharis morsus-ranæ*). Of late I have been much interested in watching the habits of the fry of *Limnæa stagnalis*, bred from specimens I had taken in North Leeds; they had only been hatched some three or four days, and measured 3 mill. They crawled persistently out of the water on to the upper surface of the leaves of the Frogbit. Is this habit inherited from some remote ancestor? So far as my experience goes it is by no means a permanent one, but seems to be exercised only during its young stage, for when it reaches a more mature age it becomes more partial to floating on the under surface of the water than of crawling out of it.—WM. NELSON, Crossgates, 24th August 1901.

***Limax cinereo-niger* near Brigg, Linc. N.**—*Limax cinereo-niger* Wolf. has been recorded for Linc. N., but I never took it till 30th September 1901. At 9 p.m. I visited the water tubs at the east end of my house in the hope of taking *L. maximus*, and found one *L. cinereo-niger* on the gravel, and ten minutes later one in the western tub. They were both almost black except along the dorsal keel, with footsole and respiratory orifice very characteristic. I should have called them the variety *ornata* if the two rows of white spots had been more distinct. The shell of the larger specimen, which, when extended was 6¾ inches long, is $\frac{1}{3}\frac{3}{2}$ of an inch long and $\frac{7}{3}\frac{7}{2}$ broad. I have known what *L. maximus* is like for over 30 years, and for some time was greatly puzzled to know what I had taken, but there was no mistaking it when I looked up and followed its specific characters.—E. ADRIAN WOODRUFFE-PEACOCK, Cadney, Brigg, 2nd October 1901.

NOTES and NEWS.

In the recently-issued list of the Geological Society, dated 6th November, the numbers of the Fellows resident in the Northern Counties are as follows: Yorkshire 69, Lancashire 58, Cheshire 24, Durham 18, Northumberland 17, Derbyshire 14, Nottinghamshire 12, Lincolnshire 5, Cumberland 4, Westmorland 3, Isle of Man 0.

NOTES on LINCOLNSHIRE MOLLUSCA.

North-west Lindsey Land Shells: Nettleton Parish.—I received the following shells on 23rd September 1901, from Miss Susan Allett, of Nettleton House, Caistor. They were gathered in Nettleton Parish:—*Helix itala* (from pit on Mansgate Hill, also from Nettleton Top; very fine specimens), *H. rufescens* and var. *alba*, *H. virgata*, *Cochlicopa lubrica* (fields and garden), *Helix caperata* (one specimen, the same), *H. cellaria*, *H. arbustorum* and var. *flavescens*, *H. hortensis* var. *lutea* 00000 and *lutea* 12345. This species is curiously rare in Lincolnshire. I have never taken it except at Crowland. *H. nemoralis* vars. *libellula* and *rubella*, commonest banding 02345 and (123)(45). The most interesting specimens sent were two very thin varieties of this last species. They may have come from the neighbourhood of an 'iron pan' in the sand, or from the Claxby Ironstone bed of the Neocomian, which forms part of the surface soil of Nettleton Parish.—E. Adrian Woodruffe-Peacock, Cadney, Brigg, Lincolnshire, 24th September 1901.

North-west Lindsey Mollusca: Cadney Parish.—I visited the Thirty-foot drain at Cadney on 1st June 1901. *Helix nemoralis*, *H. cantiana*, and *H. virgata* were plentiful; *H. arbustorum* much rarer. In two cases, within a few inches of one another, *H. nemoralis* var. *libellula roseolabiata* 02345 was in cop. with *H. arbustorum*. Within six inches I took five specimens of this variety, which I have never found elsewhere in this parish. Within two yards there were plenty of *H. nemoralis* with the type lip; and three specimens of *H. arbustorum* within the same distance. On one of the buttresses of the outfall bridge, which has been used as a Thrush-stone for the last ten years, I found two broken *H. nemoralis* var. *roseolabiata*. One has a subdistinct white peripheral band. Another specimen was a beautiful var. *albolabiata* 00300. The lip was perfect in every case. They were lying amidst a large mass of broken *H. nemoralis* and *H. cantiana*, along with at least two broken *H. arbustorum* and the unbroken valves of one *Dreissensia*. The river had been run off very low and there were tens of thousands of *D. polymorpha* half open on the mud. This was the only one carried to the Thrush-stone, though I saw a number of Thrushes taking their toll in the bed of the river. I sent my other notes, with typical specimens of *Unio* and *Anadonta* opened by birds, to my kind friend Mr. J. W. Taylor for use in the forthcoming monograph we are all eagerly looking forward to. *Helix arbustorum*, being rare on the Thirty-foot drain banks, is not often to be found on the bridge Thrush-stone, while *H. nemoralis* and *H. cantiana*, being common enough, are always in evidence after snow, or when it is so dry that insects are rare. During the burning summers since 1892 tens of thousands of molluscs have paid the penalty of being sweetly juicy and pleasantly edible for birds. In the river bed itself much could be noted, for Rooks, Black-headed Gulls, a Crow, and a Waterhen were all feeding within the range of a field-glass—the latter on *Sphærium* and *Pisidium* as far as I could make out. Specimens of *Unio pictorum* and *Anadonta anatina* had died from being unable to escape down the mud as the water fell. Some of the largest forms of both appeared to have been too deeply buried in the mud to be in time to get away before the water went off. In other cases *Dreissensiæ* had fastened their byssus to them, and the united load was more than either *Unio* or *Anadonta* could move. In a few instances the roots of the Reed (*Phragmites communis* Trin.) or Bank Sedge (*Carex riparia* Curt.), and in one case the Bladder Sedge (*C. vesicaria* L.), had been attached to shells by the byssus of one or more *Dreissensiæ*, and the frantic efforts of *Unio* and *Anadonta*, which were clearly depicted on the mud, had failed to save them. *Succinea elegans* was busy feeding on dead and open *Dreissensia polymorpha* on my third visit. The latter species, when no longer from the valve to the outer lip than $\frac{5}{32}$ of an inch was often attached in fairly shallow water to the Reed stems. —E. Adrian Woodruffe-Peacock, Cadney, Brigg, 1st October 1901.

Naturalist,

NOTES ON THE FLORA OF OVER WYRESDALE.

J. A. WHELDON, F.L.S.,
Liverpool,
AND
ALBERT WILSON, F.L.S.
Ilkley.

The wild moorland district of Over Wyresdale, situated in West Lancashire, V.C. 60, about 13 miles S.E. of Lancaster, appears to have been almost entirely unexplored botanically.

The following notes made during two brief visits to the district in the summer of 1900 may be of interest to readers of 'The Naturalist,' and will indicate some of the more characteristic botanical features.

The geological strata of Wyresdale belong almost entirely to the Millstone Grit series, limestone being absent. Otherwise the surface is very similar to that of the adjoining district of Yorkshire, immediately to the eastward, known as Bowland. For an account of the rarer plants of the latter see Mr. Pickard's interesting paper in 'The Naturalist' for February 1901.

Restricting Over Wyresdale to that part of the dale above the Abbeystead reservoir, where the two streams, Tarnbrook Wyre and Marshaw Wyre, unite (the valley below Abbeystead being known as Nether Wyresdale), three-quarters of the total area of about 20 square miles consists of unenclosed fell. This rises to an elevation of a little over 1,800 feet on Wardstone, and consists of wet peat-bog and heather-clad moor indented by deep gullies or 'cloughs' which are wooded in places with Mountain Ash, Oak, and Birch. The remainder of the district consists of upland pasture and woodland. Rugged edges of gritstone scar occur on Tarnbrook Fell above the hamlet of Tarnbrook, known as Long Crag and Hell Crag, the latter being especially wild and rough.

During a short portion of our stay in the district we had the agreeable and valued company of Messrs. A. B. Jackson, of Leicester, and S. Wilson, of Garstang.

Our thanks are due to the Rev. W. M. Rogers for kindly examining our Roses and Brambles, and to Messrs. H. N. Dixon, E. C. Horrell, and S. M. Macvicar for help in determining some of the more critical mosses and hepaticæ.

Ranunculus Lenormandi F. Schultz. Near Lower Emmetts, Tarnbrook Wyre.

Viola palustris Linn. Blaze Moss and near Abbeystead.

1901 December 3.

Genista tinctoria Linn. Near Lower Emmetts.

Rubus fissus Lindl. Stream-side below Lower Emmetts.

Rubus Scheutzii Lindeb. Road-side near top of Emmetts.

Rubus dasyphyllus Rogers. Near Emmetts, etc.

Rubus chamæmorus Linn. We did not come across this, but it is very likely to occur. It is abundant on White Moss, south of Hawthornthwaite Fell, just beyond our limits, and occurs also on the Roeburndale Fells.

Rosa mollis Sm. A great ornament to the banks of the Tarnbrook Wyre, about Lower Emmetts, and elsewhere.

Rosa canina L. var. ***dumalis*** Bechst. Near Top of Emmetts.

Rosa glauca Vill. Road-side near the last.

Pyrus Aucuparia Ehrh. Very fine in some of the gullies, especially in Black Clough, Marshaw Fell. A tree of fair size was noted near the top of Gavells Clough, on Tarnbrook Fell, at 1,520 feet.

Parnassia palustris Linn. Frequent in boggy places and wet upland pastures, ascending to about 800 feet.

Myrrhis odorata Scop. Near Lower Emmetts. Frequent in West Lancashire.

Hieracium species.—Only ***vulgatum*** Fr. and ***boreale*** Fr. were seen.

Vaccinium Vitis-Idæa Linn. Abundant, especially on the drier and more rocky parts of the fells, and frequently producing fruit, locally known correctly as 'Cowberry.'

Schollera Occycoccus Roth. This is common in the district in suitable situations, and the fruit, which is often freely produced, is gathered in quantities by the dales-people.

Andromeda Polifolia Linn. One of the most characteristic plants of the district. Common on the fells generally, and abundant on Blaze Moss. Ascends to 1,730 feet on Wardstone.

Trientalis europæa Linn. Abundant on both sides of Black Clough, Marshaw Fell, growing under deep bracken on the steep slopes above the stream. It extends for a distance of about 500 yards at an elevation of from 750 to 1,050 feet. A new V.C. record for West Lancashire.

Myosotis repens G. Don. Boggy rills in the Great Clough of Tarnbrook Fell and on Marshaw Fell.

Veronica scutellata Linn. Near the Marshaw Wyre, Blaze Moss.

Myrica Gale Linn. A few bushes by the Tarnbrook Wyre. Rare in West Lancashire.

Salix phylicifolia Linn. Road-side near Marshaw.

Juniperus communis Linn. This we did not see, but were told by a farmer that it grows sparingly on Tarnbrook Fell and Wardstone. It is very rare on millstone grit, but we have found it locally plentiful in several places on this rock high up in Roeburndale and Hindburn on the N. side of the Wardstone range.

Listera cordata R.Br. In a bog above Gavells Clough, Tarnbrook Fell, at 1,400 feet. Also seen on Wardstone at about the same altitude in 1883.

Narthecium Ossifragum Huds. Abundant in bogs, ascending to 1,730 feet on Wardstone.

Rynchospora alba Vahl. Boggy ground on lower part of the 'Black side' of Tarnbrook Fell. Very rare in West Lancashire.

Carex dioica Linn. Great Clough of Tarnbrook Fell; also on Marshaw Fell.

Carex curta Good. Very fine on Blaze Moss; also near Tarnbrook.

Carex ovalis Good. Ascends to 1,200 feet on the moor above the foot of Gavells Clough.

Carex pilulifera Linn. On the S. side of Tarnbrook Fell, at 1,450 feet.

Carex binervis Sm. Ascends to 1,400 feet on Tarnbrook Fell.

Carex fulva Good. Tarnbrook Fell and Marshaw Fell. Probably frequent in the district.

Carex rostrata Stokes. Blaze Moss.

Cryptogramme crispa R.Br. Crevices of gritstone rocks on the 'White side' of Tarnbrook Fell.

Lastræa dilatata Presl. var. ***nana*** Newm. Rock crevices of Hell Crag.

Phegopteris polypodioides Fée. Rocks by the stream in the Great Clough of Tarnbrook Fell, at 1,450 feet.

Equisetum maximum Lam. Wood above Abbeystead reservoir.

Equisetum sylvaticum Linn. Remarkably abundant about Emmetts, etc.

Lycopodium selago Linn. White side of Tarnbrook Fell, along with *Cryptogramme crispa*. Also on Long Crag, in deep crevices of rocks, very fine.

Sphagnum species.—These are in great variety and luxuriance. The following were observed:—

Sphagnum Warnstorfii Russ. var. ***versicolor*** Russ.

Syhagnum rubellum Wils. var. ***rubrum*** Grav.

Sphagnum rubellum Wils. var. ***purpurascens*** Warnst.

Sphagnum rubellum Wils. var. ***versicolor*** Warnst.

Sphagnum acutifolium R.&W. var. ***viride*** Warnst.

Sphagnum acutifolium R.&W. var. ***versicolor*** Warnst.

Sphagnum subnitens R.&W. var. ***violascens*** Warnst.

Sphagnum subnitens R.&W. var. ***obscurum*** Warnst.

Sphagnum cuspidatum R.&W.

Sphagnum recurvum R. & W. var. ***mucronatum*** Warnst.

Sphagnum molluscum Bruch.

Sphagnum compactum DC. var. ***imbricatum*** Warnst.

Sphagnum rufescens Warnst.

Sphagnum medium Limpr. var. ***roseum*** Warnst.

Sphagnum cymbifolium Limpr. var. ***glaucescens*** Warnst.

Sphagnum cymbifolium Limpr. var. ***glauco-pallens*** Warnst.

Sphagnum papillosum Lindb. var. ***normale*** Warnst.

Andreæa Rothii W.&W. Great Clough of Tarnbrook Fell.

Andreæa Rothii W.&W. var. ***falcata*** Ldb. Grows in Hawthornthwaite and Catshaw Greaves, just beyond our limits, and is likely to occur. The same remark applies to *A. crassinervia* Bruch, which is found in Roeburndale, two miles N.E. of the Wyresdale district.

Catherinea crispa James. Frequent by the Tarnbrook and Marshaw Wyres. A highly characteristic plant of the sandy banks and beds of upland streams throughout the millstone grit area of West Lancashire.

Polytrichum species—***aloides*** Hedw., ***urnigerum*** L., ***strictum*** Banks, ***formosum*** Hedw., and ***commune*** L. All common in the district.

Polytrichum alpinum L. Tarnbrook Fell and near Marshaw, with abundant fruit, descending to 600 feet.

Oligotrichum incurvum Lindb. Abundant on gravelly moor slopes in the Great Clough of Tarnbrook Fell and in the Trough of Bowland (Lancashire side). Probably frequent throughout the district.

Dicranella cerviculata Schp. Trough of Bowland above Marshaw.

Blindia acuta B. & S. Gavells Clough, Tarnbrook Fell.

Campylopus atrovirens DeNot. Sparingly on Tarnbrook Fell.

Campylopus flexuosus var. ***zonatus*** Milde. A plant referred by Mr. Dixon to this occurs in rock crevices on the 'White side' of Tarnbrook Fell.

Dicranodontium longirostre B.&S. Hell Crag, in damp, shady crevices of rocks. Altitude 1,300 feet; along with *Mylia Taylori* (Hook.) and *Bazzania trilobata* (L.).

Dicranum scoparium Hedw. var. ***turfosum*** Milde. Summit of Wardstone.

Dicranum fuscescens Turn. Tarnbrook Fell, etc.

Leucobryum glaucum Schp. Tarnbrook Fell, etc. Common.

Rhacomitrium species—***lanuginosum*** Brid., ***fasciculare*** Brid., ***aciculare*** Brid. All common in the district.

Rhacomitrium canescens Brid. Near Marshaw.

Splachnum sphœricum Linn. Boggy ground on S.E. side of Wardstone, at 1,600 feet.

Discelium nudum Brid. Shale banks near the Tarnbrook Wyre; abundantly fruiting.

Amblyodon dealbatus P.Beauv. Moor above the foot of Gavells Clough.

Bryum pseudo-triquetrum Schwæg. Common on the fells.

Bryum alpinum Huds. By the track ascending Wardstone from Tarnbrook.

Climacium dendroides W.&M. Frequent in boggy places.

Hyocomium flagellare B.&S. Common on stones in streams.

Plagiothecium Borrerianum Spruce. Long Crag, etc.

Hypnum species ***stellatum*** Schreb., ***revolvens*** Sw., ***commutatum*** Hedw., ***falcatum*** Brid., ***ochraceum*** Turn., and ***stramineum*** Dicks. All frequent on the fells.

Hypnum fluitans L. var. ***Jeanbernati*** and var. ***falcatum*** Schp. Tarnbrook Fell, etc.

Hypnum exannulatum Gümb. The following forms were noted:—Var. ***pinnatum*** Boul., var. ***purpurascens*** Schmp., and var. ***falcifolium*** Ren. with forma ***inundata*** Ren.

Hypnum scorpioides L. On the slope of Marshaw Fell, near Blaze Moss.

Hypnum sarmentosum Wahl. On the cold N. side of Marshaw Fell, at only 600 feet; a remarkably low altitude for this moss.

Lepidozia Pearsoni Spruce. Hell Crag.

Cephalozia fluitans (Nees). Tarnbrook Fell.

Bazzania trilobata (L.) and ***Mylia Taylori*** Hook. Abundant and forming large luxuriant mats in the shady recesses of Hell Crag and Long Crag. Also on the 'White side' of Tarnbrook Fell and on Marshaw Fell.

Scapania undulata L. Tarnbrook Fell.

Scapania resupinata (L.). Tarnbrook Fell.

Scapania resupinata (L.) var. ***minor.*** Long Crag.

Jungermania inflata Huds. Tarnbrook Fell.

Jungermania gracilis Schleich. Tarnbrook Fell.

Aneura pinguis (L.). Above Marshaw.

Chomiocarpon quadratus (Scop.). Gavells Clough.

NOTES on FLOWERING PLANTS.

Flower Colours, Caythorpe, Lincs.—Miss S. C. Stow sent me on 23rd August 1901, from the Lincolnshire Limestone at Caythorpe Heath, Grantham, the bright pink flowered colour variety of *Pimpinella Saxifraga, dissecta* With. It was taken growing with the type colour form.—E. Adrian Woodruffe-Peacock, Cadney, Brigg, 27th August 1901.

***Callitriche autumnalis* in North or Lake Lancashire.**—I do not think this species (*Callitriche autumnalis*) has been recorded for the above vice-county. I possess specimens of it, gathered by Mr. H. T. Mennell. He found it 'in great plenty' in the Canal from Hutton to Farleton (between Carnforth and Milnthorpe), on 1st September 1891.

Mr. Baker, in his 'Lake Flora,' notes that he has not seen the 'true plant within our bounds.' Mr. L. Petty and Mr. Hodgson do not name it, and though actually recorded, the records are very doubtful, and probably *C. hamulata* was intended. Yet it should occur, as it is certainly to be found in Northumberland and Cheviotland. Beyond the records in the 2nd edition of Topl. Botany, the species occurs in the following counties, exactly doubling the number given in Topl. Botany:—

County 60.	Lancashire West	... ...	F. C. King, sp.
,, 69.	,, Lake	... ...	H. T. Mennell, sp.
,, 72.	Dumfriesshire	... ...	Fingland, sp.
,, 73.	Kirkcudbrightshire	...	H. Coles sp.
,, 74.	Wigtonshire ...	.. ...	J. McAndrew, sp.
,, 75.	Ayrshire ...	... ...	A. Davidson, sp.
,, 86.	Stirlingshire ...	... ...	Kidston, sp.
,, 88.	Perthshire Mid	... ...	J. of Botany, 272, 1884.
,, 90.	Forfarshire ...	... ...	Dr. Traill, MS.
,, 92.	Aberdeenshire South	...	,, MS.
,, 93.	,, North	...	Ann. Scot. N. Hist., 169, 1901.
,, 94.	Banffshire ...	.. ...	J. of Botany, 240, 1884.
,, 96.	Easterness ...	... ...	Druce, 7, 1887.
,, 100.	Clyde Isles ...	.. ...	Marshall, sp., 1901.
,, 101.	Cantire	... ...	J. McRae, sp.
,, 105.	Ross West	... ...	Druce ex Newbould.
,, 112.	Shetland	... ...	Beeby, sp.

—Arthur Bennett, Croydon, 21st October 1901.

NOTES on LEPIDOPTERA.

***Heliothis dipsaceus* at Woodhall Spa.**—I should like to record the occurrence of *Heliothis dipsaceus* on the heath at Woodhall Spa in August last. I took two specimens. I understand this moth is rare in these parts. —J. C. Lane-Claypon, Aswardby Hall, Spilsby, Lincolnshire, 2nd Sept. 1901.

Brimstone Butterfly at Silverdale, West Lancs.—On 7th June, whilst driving from Silverdale Station to the village, a very fair specimen (apparently) of *Gonepteryx rhamni* L. flew alongside the carriage for about a hundred yards. See 'The Naturalist,' 1885, p. 167.—S. L. Petty, Ulverston, 1st July 1901.

Hawkmoths at Spurn.—The larva of the Death's Head Moth (*Acherontia atropos*) has been very common here; I never remember seeing more than we have had this season.

A nice lot of *Sphinx convolvuli* have occurred here this season; the last one I saw was very busy on the Tobacco plants in the early part of the evening, when not quite dusk, on the 5th of October.—Philip W. Loten, Easington, 12th October 1901.

Death's Head Moth near Cleckheaton, York S.W.—I obtained on the 30th September last a specimen of *Acherontia atropos* near here. It was dead and slightly battered.

I have only heard of *one* specimen ever being taken in this district before, and that was forty years since.

I have both specimens. The old one is 133 mm. across the wings, the new one only 123 mm.—R. W. Crosland, Oldfieldnook, Cleckheaton, 20th November 1901.

Hawkmoth Chrysalids and Hummingbird Hawkmoth in South Lincolnshire.—Dr. P. Sharp, of Brant Broughton, Div. 13, has now in his possession five chrysalids, taken either in or near the parish, viz.:—Three of the Death's Head Hawkmoth (*Acherontia atropos*), one of the Privet Hawkmoth (*Sphinx ligustri*), and one of the Lime Hawkmoth (*Smerinthus tiliæ*). I saw the two last when in the caterpillar state.

The Hummingbird Hawkmoth (*Macroglossa stellatarum*) has been fairly abundant in this neighbourhood this season.—S. C. Stow, Court Leys, Brandon, Grantham, 24th October 1901.

Marbled White Butterfly near Helmsley.—I happened to see in your paper mention of the occurrence this year of the Marbled White (*Melanargia galathea*) near Scarborough. I thought it might be of interest to know that I came upon a specimen of that insect in Sleightholmdale, about four miles from here, in July last. Though I was unable to capture it I have no doubt whatever of its identity, and, though we spent some time in searching, we were unable to find any more. I have been collecting here for nearly seven years, and have never before seen the insect in this neighbourhood or heard of its appearance.—Hubert B. Drew, c/o The Earl of Feversham, Duncombe Park, Helmsley, 5th October 1901.

Occurrence of the Marbled White Butterfly near Louth, Linc. N.—On 5th August last, paying a flying visit to Lincolnshire, and walking on the steep grassy bank which runs off from the chalk-pit at Redhill, Goulceby, I was delighted to encounter this old acquaintance—the *Melanargia galathea*—in a locality not previously known for it. The first seen was at rest on a flower, and subsequently others were seen on the wing. Former collectors in Louth were acquainted with this butterfly on the grassy margins of a chalk-pit in Haugham Pasture and in the chalky valley known as Grisel Bottom in Burwell Wood; and in the former place I well remember seeing it on the wing in good numbers. This was twenty years ago. In the meantime, as I learn from Mr. R. W. Goulding, the insect has been reported also from the chalky bank at the end of Hubbard's Hill.—H. Wallis Kew, London, 9th November 1901.

NOTE on YORKSHIRE FUNGI.

Additions to the Cadeby List of Fungi.—I have to add the following species to my list in the November 'Naturalist,' pp. 343-350 :—

Mycena leucogala Cooke.
Gomphidius viscidus Fr.
Physarum leucopus Rost.
Trichia chrysosperma (Bull.) DC.
Arcyria cinerea Schum.

This brings the total up to 304 species and 2 varieties.—C. CROSSLAND, Halifax, 19th November 1901.

NOTES on YORKSHIRE BIRDS.

Hawfinch at Huddersfield.—On 16th July last Mr. Francis Bower, son of the Vicar of this parish, sent to me (alive) a Hawfinch (*Coccothraustes coccothraustes*), which had just been caught in the village schoolroom. As the bird was apparently a young one, it had in all probability been bred in the district.—GEO. T. PORRITT, Crosland Hall, near Huddersfield, 19th September 1901.

Hawfinch at Sedbergh.—On the 19th of September, noticing a strange bird in one of the trees at Akay, and being unable to identify same, my son shot it, when it proved to be a Hawfinch (*Coccothraustes coccothraustes*). As this is the first instance of a specimen of this bird being seen at Sedbergh, I thought it might be worth notifying.—C. E. TAYLOR, Akay, Sedbergh, Yorkshire, 17th October 1901.

Great Spotted Woodpecker Nesting in Meanwood Wood, Leeds.—On 20th June this year, while examining a hole in a stunted Mountain Ash, a man who has a garden bordering on this wood approached me and, after a little conversation, I told him what I thought the hole in the tree was. I was pleased to hear that last year he watched what he described as a bird about the size of a Chaffinch, but spotted, feed its young. It would cling to the tree, when out peeped the young birds to be fed; he had seen this on several occasions. The chippings on and about the tree were new, but as I did not care to disturb the home of this bird by cutting my way in, I left it, and shall, all being well, pay a visit another season. No doubt the bird was *Dendrocopus major*.—THOS. RAINE, Woodland View, Chapel-Allerton, Leeds, 25th September 1901.

BOOK NOTICE.

New Text-Book of Zoology.—
Zoology | an Elementary Text Book | By | A. E. Shipley, M.A., | . . | . . | . . | and | E. W. MacBride, M.A. | . . | . . | . . | Cambridge : | At the University Press. | 1901. [8vo. cloth, pp. xxii. + 632, price 10s. 6d. net].

This is another of the excellent Natural Science Manuals emanating from the Cambridge University Press, and though aiming more especially to be of service to those who have had no previous zoological training, the book will be found to be of immense value even to the more advanced and expert student, the facts of structure, development, and modern classification of the various phyla of the animal kingdom being fully illustrated in the text by tabular exposition and about 350 large and clearly-engraved woodcuts, and explained in a terse, forcible, and attractive style in the text which keeps alive the keen interest of the reader. The book is beautifully printed and the binding is in the same good taste that has distinguished the previous volumes of the Cambridge Natural Science Manuals.—T.

SPIDERS OF NORTHUMBERLAND AND DURHAM: SOME NOTES OF RECENT CAPTURES.

Rev. J. E. HULL,
Haltwhistle, Northumberland.

The records here set forth are supplementary to those contained in my 'Catalogue of the Spiders of Northumberland and Durham' (Natural History Transactions of Northumberland, Durham, and Newcastle-on-Tyne, Vol. 13, Part 1). In that list 192 species were recorded for the two counties. The additions now made will bring the total up to 210, nineteen species being added and one removed.

Of these nineteen, one is new to science.

Diplocephalus spinosus sp. n. Nearly allied to *D. permixtus* Cb., but may be distinguished by the following characters: Cephalothorax, legs, and palpi yellowish, clouded with black; abdomen almost black, clothed with dark hairs. Cephalic lobes, clypeus, and situation of eyes, as in *D. permixtus*, but the transverse furrow is deeper, the lobes are yellowish tinged with black at the summits, and the eyes are situated on black spots. The tibial process of the palpus is somewhat similar to that of *D. permixtus*, but has three spines instead of two.

A single adult male was found among moss at the edge of a bog on Plenmellor Common, July 1901.

Tapinopa unicolor Cb. (Proc. Berwicksh. Nat. Club, Vol. 7, No. 2, p. 317). Must disappear as the name of a separate species, becoming a synonym of *T. longidens* Wid. (Pickard-Cambridge, 'List of British and Irish Spiders,' 1900). Of this form of *T. longidens* I took an adult female in June of this year.

The other eighteen species which have turned up since the publication of my list in 1896 are as follows:

Clubiona brevipes Bl. Adult male, Haltwhistle.

Agrœca brunnea Bl. Fairly common among the heather on the fells.

Hahnia montana Bl. In woods, near Featherstone Castle.

Hahnia nava Bl. Two females, Featherstone.

Pedanostethus arundinetus Cb. Haltwhistle.

Taranucnus setosus Cb. Boggy places, near Haltwhistle.

1901 December 3.

Leptyphantes nebulosus Sund. Ovingham; Featherstone.

Leptyphantes pallidus Cb. Woods at Blenkinsopp.

Leptyphantes mengii Kulc. Featherstone.

Bathyphantes pullata var. ***cruciger*** Bl. Ovingham.

Erigone longipalpis Sund. Hancock Museum, Newcastle.

Lophomma herbigradum Bl. Adult females, Featherstone.

Gongylidiellum latebricola Cb. Walltown Moss.

Epeira quadrata Clerck. Haltwhistle; Ninebanks, etc.

Xysticus pini Hahn. Adult female, Slaley; adult male, Walltown.

Philodromus cespiticolis Walck. Generally distributed.

Thanatus striatus C.L.K. River-bank at Ovingham.

Trochosa spinipalpis F.Cb. Featherstone.

Of these, *Bathyphantes cruciger* is certainly only a variety of *B. pullata*; and possibly *Philodromus cespiticolis* should be regarded as a form of *Ph. aureolus* Clk., following Simon and Kulczynski, but the Rev. O. Pickard-Cambridge in his British List classes it as a separate species. I may here acknowledge my indebtedness to Mr. Pickard-Cambridge for much kind help in the identification of some of the more critical species.

A few brief notes may be given concerning species already recorded, but of rare occurrence with us, or where the record calls for correction or qualification.

Harpactes hombergii Scop. On rocks at Haltwhistle.

Oönops pulcher Temp. Hedge-bank at Tynemouth.

Micaria pulicaria Sund. Tynemouth; Haltwhistle.

Prosthesima petiverii Scop. Whitley Chapel.

Clubiona lutescens West. Holywell Dene—the northernmost record.

Clubiona trivialis C.L.K. An adult female, Whitfield.

Clubiona diversa Cb. (*C. pallens* L. Koch. The *C. pallens* of Blackwall is a different spider). This is the spider recorded by me as *C. pallens*. I have since met with it at Ravensworth, Haltwhistle, and Thorneyburn.

Cicurina cinerea Panz. An adult male, Tynemouth.

Nesticus cellulanus Clk. Plentiful under stones, Haltwhistle Burn.

Leptyphantes ericæus Bl. Not uncommon at Haltwhistle.

Leptyphantes obscurus Bl. Gibside, Featherstone, and elsewhere.

Tmeticus contritus Cb. This is the generic position assigned now by Mr. Pickard-Cambridge to the spider which I conjectured to be a *Porrhomma*.

Tmeticus huthwaitii Cb. An adult male, Haltwhistle.

Tmeticus reprobus Cb. To this species must be referred the spider taken at Whitley and described as new by me under the name of *Tmeticus denticulatus*. A single example had been taken by Mr. Pickard-Cambridge at Weymouth many years ago. After an interval of over thirty years it was taken within a short period at places so wide apart as Whitley, Edinburgh, and Dublin Bay—always, as at Weymouth, by the sea near high-water mark.

Pedina scopigera Grube. This I find to be quite a common spider under stones, at any rate in sub-alpine regions.

Neriene. Mr. Pickard-Cambridge has shown that, historically, this generic name should not be applied to the group of spiders which I, following Kulczynski and Simon, included under it. The right to the name rests between *Neriene* (*Gonatium* Menge) *rubens* and *N.* (*Dicyphus* Menge) *cornuta*, described simultaneously by Blackwall in 1833. Mr. Pickard-Cambridge assigns it to the former, suppressing the name *Gonatium* but retaining *Dicyphus* (List of British and Irish Spiders), though he points out that the latter is preoccupied for a genus of Hemiptera. The group recorded by me under *Neriene* he includes under *Gongylidium*. This does not apply to the two Cheviot spiders, placed here because I was ignorant of their true generic position. The types (which are unique) are in the possession of Mr. Pickard-Cambridge, in whose recently-published List *N. morula* is referred to the genus *Sintula*, and *N. curtipes* is placed, with an expression of doubt, under *Lophomma*.

Plæsiocrærus. In Mr. Pickard-Cambridge's new List this genus of M. Simon is included with *Diplocephalus*, and *D. humilis* removed to the genus *Araeoncus*.

Diplocephalus fuscipes Bl. Adult male, Haltwhistle.

Diplocephalus permixtus Cb. Adult males, Haltwhistle.

Diplocephalus alpinus Cb. Adult males, Haltwhistle.

Nematogmus obscurus Walck. Ovingham; Haltwhistle; Ravensworth.

Cornicularia pudens Cb. and ***C. pavitans*** Cb. The position conjecturally assigned to these spiders is confirmed by Mr. Pickard-Cambridge.

1901 December 3.

Peponocranium ludicrum Cb. Plentiful on furze and heather —Haltwhistle, Ravensworth, etc.

Oxyptila trux Bl. Holywell Dene ; Thorneyburn ; Haltwhistle.

Tibellus oblongus Walck. Walltown Moss ; Whitfield.

Ocyale mirabilis Clk. Whitfield.

Trochosa cinerea Fabr. Sandy places by the river—Bywell ; Haltwhistle.

Lycosa herbigrada Bl. Gibside ; Slaley.

Neon reticulatus Bl. Haltwhistle, fairly common.

It will be seen that my collecting has been confined to the valley of the Tyne. More workers are greatly needed ; cannot our clubs and societies do something to popularise this branch of natural history? I will gladly assist in the identification of specimens.

NOTES on FLOWERING PLANTS.

***Carex filiformis* in Lancashire.**—This *Carex* (*C. filiformis* L.) is recorded from Lake Lancashire by Mr. W. Matthews, in the Botanical Record Club Report, page 111, 1887, but the county number is printed '60' instead of 69. The locality given is 'Low end, Coniston-water, near Lake Bank.' Under the name of *C. lævigata* Sm., I possess a specimen of *C. filiformis,* gathered by Mr. G. E. Hunt, June 1865, from 'Stalyhinsly, Lancashire.' I can find no such name in my Gazetteers. Perhaps some reader can kindly supply the information as to which vice-county of Lancashire this is in?—ARTHUR BENNETT, Croydon, 18th October 1901.

***Peucedanum palustre* in Lake Lancashire.**—After reading Mr. Bennett's interesting proof of existence (ante 267) of a North Lancashire specimen of *P. palustre,* sent by Withering, probably, to Winch, I wrote to Mr. Bennett for a copy of the label. This he has kindly sent me. From the copy below it will be seen that Hall sent the roots of this and probably others to his friends, and so aided its extirpation. Label: 'Sent by Mr. Hall, from Naston, near Cartmell, Lancashire, where it grows wild. The root he sent was cultivated at Perry Hill, July 10 1785.'

The preface to the second edition of Withering is dated August 1787, and two volumes were issued in that year. In Vol. I., p. 282, is the record of the species:—'Found in 1779 or 1780 by Mr. Seatle, at Cannon Winder, near Flookburgh, Lancashire, in the ditches near the sand side, not very plentiful; and I have since found it round the sides of Ayside Tarn, three miles north of Cartmell—Mr. Hall. Brought to me and Mr. Crowe, when in Lancashire in 1781, by the Rev. Mr. Jackson—Mr. Woodward.' Now as to the truth of the assertion on the label. There is no place called Naston in North Lancashire. What was meant is Newton-in-Cartmel, where Hall was born in 1756, and died 16th May 1815. Cannon Winder is a house on the shore. Newton a village high up, beyond Grange, with, so far as I know, not even a village pond to make an imitation marsh, but it is some years since I was there. It is a pity that neither Withering or Stokes mentioned the existence of the specimen, or perhaps specimens, distributed by Hall. So far as I know Seatle is forgotten. Jackson died not long after as Vicar of Ulverston. Crowe and Woodward no doubt left herbaria; have they been examined for *Peucedanum palustre?* I sought for the plant at Ayside in vain some years ago.—S. L. PETTY, Ulverston, 23rd Sept. 1901.

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